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USAFOEHL REPORT

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**HAZARDOUS WASTE TECHNICAL
ASSISTANCE SURVEY, MARCH AFB CA**

CHARLES W. ATTEBERY, 1Lt, USAF, BSC

March 1989

Final Report

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**USAF Occupational and Environmental Health Laboratory
Human Systems Division (AFSC)
Brooks Air Force Base, Texas 78235-5501**

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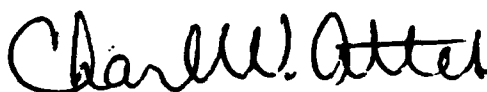
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<p>A hazardous waste survey was conducted at March AFB by USAFOEHL from 9 to 18 Mar 88. The scope of the survey was to evaluate hazardous waste management practices and explore opportunities for waste minimization. The survey team performed a shop-by-shop evaluation of chemical waste management practices and met with hazardous waste managers and engineers to discuss the hazardous waste program. The results of the survey showed the base hazardous waste program operating well.</p> <p>Recommendations: (1) The base needs to establish a waste analysis plan. (2) Warning signs should be posted at all hazardous waste accumulation sites. (3) The Battery Shop Accumulation Site should be moved inside Building 1201 and changed to a satellite accumulation site. (4) Blueprints and work orders should be routinely reviewed by the Environmental Coordinator. (5) A lock should be installed on the Auto Hobby Shop waste antifreeze tank. (6) Air filters and wastewater from paint booths along with spent bead</p>				
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blasting media should be periodically tested for hazardous waste characteristics. (7) A formalized hazardous waste training program should be developed and presented to accumulation site managers as a group. (8) The outdated poisonous chemicals being stored at the CES Entomology Shop should be disposed of through DRMO. (9) A manager for the accumulation site located next to Building 458 needs to be formally designated. (10) The barrels of hazardous waste located outside of Building 2315 in the parking lot should be placed in an acceptable accumulation site. (11) A basewide hazardous waste tracking system should be developed. (12) Proper waste identification terminology needs to be used when filling out the DD Form 1348-1. (13) The base should investigate the feasibility of a PD-680 vacuum recycler. (14) The BEE Shop needs to obtain proper hazardous waste sampling equipment. (15) The NDI Shop should consider discharging waste developer directly to the sanitary sewer system. (16) The base should address with DRMO the need to schedule more frequent pick-ups. (17) The Environmental Coordinator should notify the Fire Department when a waste disposal contractor comes on base. (18) The use of Safety Kleen units or alternative solvents should be investigated. (19) The base should look into selling used lead-acid batteries. (20) A determination of whether used rags are hazardous waste needs to be made. (21) The base should investigate the possibility of washing and reusing rags. (22) The base should discharge waste antifreeze to the sanitary sewer on a trial basis. (23) The base should purchase a compressor for the plastic media bead blasting unit at FMS Corrosion Control. (24) The base should investigate obtaining a waste transporter permit and a licensed vehicle.

ACKNOWLEDGMENT

The survey team wish to thank the personnel at March AFB who provided information and logistic support during our visit. Major Killan, Chief, Bioenvironmental Engineer, and personnel from the Bioenvironmental Engineering Shop, USAF Regional Hospital March/SGPB, and Lt Bachand, Environmental Coordinator, 22 CES/DEEV, were especially supportive of the mission during and after the field survey.

References

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I. INTRODUCTION

In an 18 Sep 1987 letter (Appendix A), 22 Strategic Hospital/SGPB requested the USAF Occupational and Environmental Health Laboratory, Consultant Services Division, Environmental Quality Branch (USAF OEHLE/ECQ), to conduct a hazardous waste technical assistance survey at March Air Force Base (MAFB). The scope of this survey was to address hazardous waste management practices and to explore opportunities for hazardous waste minimization.

The survey was conducted by Maj Elliot K. Ng and 1Lt Charles W. Attebery from 9 to 18 Mar 1988.

II. BACKGROUND

A. Base Description

March AFB is located in Southern California near Riverside, California. The base is the home of the 22nd Refueling Wing, the 452nd Air Force Reserve Refueling Wing, 943rd Air Force Reserve Refueling Wing and 163rd Air National Guard F-4E Fighter Wing.

B. Hazardous Waste Management Program

The March AFB Hazardous Waste Management Program is operating well. Transportation of wastes around base is kept to a minimum and waste storage sites are centrally located. Many of the accumulation sites were recently constructed and were managed by conscientious accumulation site managers and a dedicated Environmental Coordinator. The following is a brief description of the March AFB Hazardous Waste Program.

The general flow of hazardous wastes on March AFB is as follows (a graphical representation is presented in Figure 1).

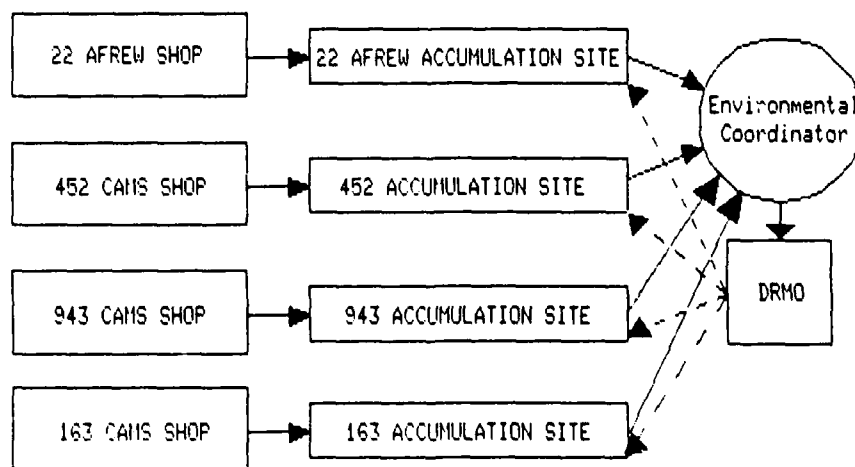


Figure 1. FLOW OF HAZARDOUS WASTE ON MARCH AFB

1. Hazardous wastes are drummed at the shop-level and stored at one of several accumulation sites on base.

2. The accumulation site managers are responsible for keeping records of wastes stored at their sites and filling out DD Form 1348-1 (Figure 2) to turn-in hazardous wastes to Defense Reutilization and Marketing Office (DRMO) located at Norton AFB.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100																																																	
SHIP FROM										SHIP TO										MARK FOR PROJECT										TOTAL WEIGHT																			
WAREHOUSE LOCATION										UNIT NO. DATE										UNIT CUBE										FREIGHT RATE										QUANTITY									
FREIGHT CLASSIFICATION NOMENCLATURE										ITEM NOMENCLATURE																																							
SELECTED BY AND DATE										TOTAL WEIGHT										RECEIVED BY AND DATE										INSPECTED BY AND DATE																			
PACKED BY AND DATE										TOTAL CUBE										WAREHOUSED BY AND DATE										WAREHOUSE LOCATION																			
REMARKS:																																																	
FIRST DESTINATION ADDRESS										DATE SHIPPED																																							
TRANSPORTATION CHARGEABLE TO										14 D/LABOR AND OR RECEIVER'S SIGNATURE (AND DATE)										15 RECEIVER'S DOCUMENT NUMBER																													

DD FORM 1348-1 14 PART 1 MAR 74 ODD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

Figure 2. DD Form 1348-1

3. The accumulation site managers submit DD Form 1348-1 to the Environmental Coordinator who reviews the form and assigns serial numbers to the drums before submitting the paperwork to DRMO.

4. DRMO contracts the waste pick-up from each accumulation site and pre-inspects the hazardous waste containers prior to pick-up.

5. On the designated pick-up day, the contractor and a DRMO representative will come to the base for the pick-up. The contractor will typically check the contents of drums (by smelling). Petroleum products are usually pumped out directly into a tank while the empty drums are crushed to conserve space. Any wastes found to be contaminated with unknown products are not picked up and an analysis of the contents by the base Bioenvironmental Engineer (BEE) is requested.

There are three separate military components operating on March AFB: the active duty force (22nd Air Refueling Wing); the Air Force Reserve Component (452nd ARFEW, 943rd TAG and 942nd CMS); and the Air National Guard Unit (163rd ANG). The hazardous waste program for each of these units falls under the responsibility of Lt Bachand, the base Environmental Coordinator. Lt Bachand trains new accumulation site managers, inspects the accumulation sites every month and coordinates spill response actions.

III. PROCEDURE

The Bioenvironmental Engineering (BEE) Shop personnel started gathering information before the survey team arrived on base. Upon arrival, the survey team was presented with a comprehensive list of shops, points of contact and a preliminary determination of the magnitude of waste generation for each shop. After reviewing the shop information, the team proceeded to visit the shops identified as major hazardous waste generators. The purposes of the visits were to: (1) observe the industrial operations; (2) discuss chemical waste disposal practices with shop personnel; and (3) hand out chemical waste disposal survey forms (see Appendix B). These forms were later picked up during the survey and the information used for subsequent discussions with shop personnel. The following individuals were contacted to discuss their respective areas of responsibility in the hazardous waste program:

Major Gene Killan, Chief, Bioenvironmental Engineering, SGPB, AV 947-3952
2Lt Gooden, Bioenvironmental Engineer, SGPB, AV 947-3952
2Lt Bachand, Environmental Coordinator, OEEV, AV 947-4855
Ms Billy Maddi, Hazardous Waste Manager, DRMO (Located at Norton AFB),
AV 876-6501

Based on information from the completed survey forms, twelve categories of waste generated (see Table 1) by March AFB were established and annual forecasted quantities calculated. From Table 1, column 4 (see Appendix C for calculations), the majority of wastes, (73 percent), are comprised of waste oils, waste fuels, and waste PD-680 (categories 5, 6 and 9, respectively).

TABLE 1. CATEGORIES OF WASTE AT MARCH AFB

CATEGORY	PRODUCT	TOTAL (gal/yr)	% TOTAL CATEGORIES
1	Waste Paint and Thinners	732	2.51
2	Strippers	982	3.36
3	Neutralized Battery Acids	1,724	5.90
4	Soaps and Cleaners	2,175	7.45
5	Waste Petroleum Products	14,397	49.29
6	Waste Fuel	3,732	12.78
7	Antifreeze	1,033	3.54
8	Solvents ¹	578	1.98
9	PD-680	3,283	11.24
10	NDI Wastes	520	1.78
11	Chemotherapeutic	50	0.17
12	Waste Rags ²	170 (drums)	---
		TOTALS: 29,206	100.00

1 - does not include 5 Safety Kleen Units

2 - waste rags were not included in calculations (drums per year).

IV. DESCRIPTION OF INDUSTRIAL ACTIVITIES AND WASTE DISPOSAL PRACTICES

The following are brief summaries of industrial shop activities and conditions of accumulation sites on March AFB. See Appendix D for a summary of waste disposal practices by shop.

A. 22 Transportation/LGTM
Contact: MSgt Schaffer

AUTOVON: 947-2082

Shop: Allied Trades/Battery Shop
Contact: MSgt Schaffer

Building: 429
AUTOVON: 947-2082

Allied Trades personnel are responsible for repairing vehicular body components on military vehicles. Shop operations include sanding, welding, small amounts of stripping, painting and degreasing. Stripper is applied to a painted surface and is adsorbed. Waste paint and thinner are drummed and disposed of through DRMO. The Battery Shop personnel are responsible for filling, draining, disposing and servicing lead-acid batteries. Waste acid is neutralized with baking soda, placed in a plastic container and disposed of through DRMO. Battery casings are turned over to Morale Welfare/Recreation (MWR).

Shop: Fire Truck Maintenance
Contact: SSgt Hughley

Building: 1223
AUTOVON: 947-4026

Fire Truck Maintenance personnel provide the base Fire Department with vehicle maintenance services. Maintenance includes oil changes, major tune-ups, and minor spot painting. The primary wastes from the facility are waste automotive oils and fluids. These wastes are drummed, transported to the Transportation Squadron Accumulation Site and disposed of through DRMO.

Shop: General/Special Purpose Maintenance
Contact: MSgt Schaffer

Building: 429
AUTOVON: 947-2082

The General and Special Purpose Maintenance Shop personnel are responsible for all stages of maintenance on general purpose vehicle fleet and special equipment. Waste petroleum products comprise the majority of the waste generated. The waste petroleum products are stored in a 500-gallon bowser located at the Building 429 Accumulation Site. When the bowser is full, the waste petroleum is transferred to an underground tank at the base service station. The shop operates two Safety Kleen units (20 gallons each) that are changed out every other week.

Shop: Refueling Truck Maint
Contact: TSgt Davis

Building: 1250
AUTOVON: 947-2877

Refueling Truck Maintenance personnel are responsible for the complete maintenance and repair of refueling vehicles. Waste petroleum products comprise the majority of the waste generated. Waste oils and antifreeze are typically drummed and transported to the Building 429 Accumulation Site. Waste fuels (approximately 125 gallons per month) are discharged to the drain

system. The drain system is attached to a fuel/water separator and a holding tank (approximately 500-gallon). The tank is pumped out by contractor. The shop operates one Safety Kleen unit.

Accumulation Site
Site Manager: Mr Halpin

Building: 429
AUTOVON: 947-2081

The 22 Trans Accumulation Site manager handles all hazardous waste disposal for the organization. The organization includes Allied Trades, Minor Maintenance, Fire Truck Maintenance, General/Special Purpose Maintenance, Packing and Crating, and Refueling Truck Maintenance. The accumulation site located just outside Building 429 consists of a few hazardous waste barrels and a 500-gallon bowser for petroleum products. The site was not secured, was not diked, had no warning signs, spill or fire protection equipment. Mr Halpin fills out DD Form 1348-1 and contacts Lt Bachand when he has waste that needs to be picked up. He also coordinates the transportation of the bowser to the base service station. A new accumulation site has been built, however, the site is unusable because the entrance is blocked by a large air conditioning unit.

B. 22 FMS

Contact: Lt Cafiso

AUTOVON: 947-2296

Shop: AGE
Contact: SMSgt Holterman

Building: 1221
AUTOVON: 947-2109/

22 FMS AGE personnel service, repair, inspect and operate flight line power and nonpower aerospace ground support equipment. The majority of the wastes generated are waste petroleum products. Waste oils (approximately 75 gallons per month) are stored in a 200-gallon bowser. The petroleum waste bowser is emptied at the POL holding area. Waste fluids and PD-680 are drummed and stored at the Building 1221 Accumulation Site. PD-680 used on the washrack is discharged to the sanitary sewer system.

The accumulation site (Figure 3) is located behind Building 1221, next to the washrack. The site was not secured, had no warning signs, spill or fire protection equipment. SSgt Morse is the accumulation site manager and fills out DD Form 1348-1. He is responsible for the hazardous waste training for the AGE shop and trains the shop personnel annually.

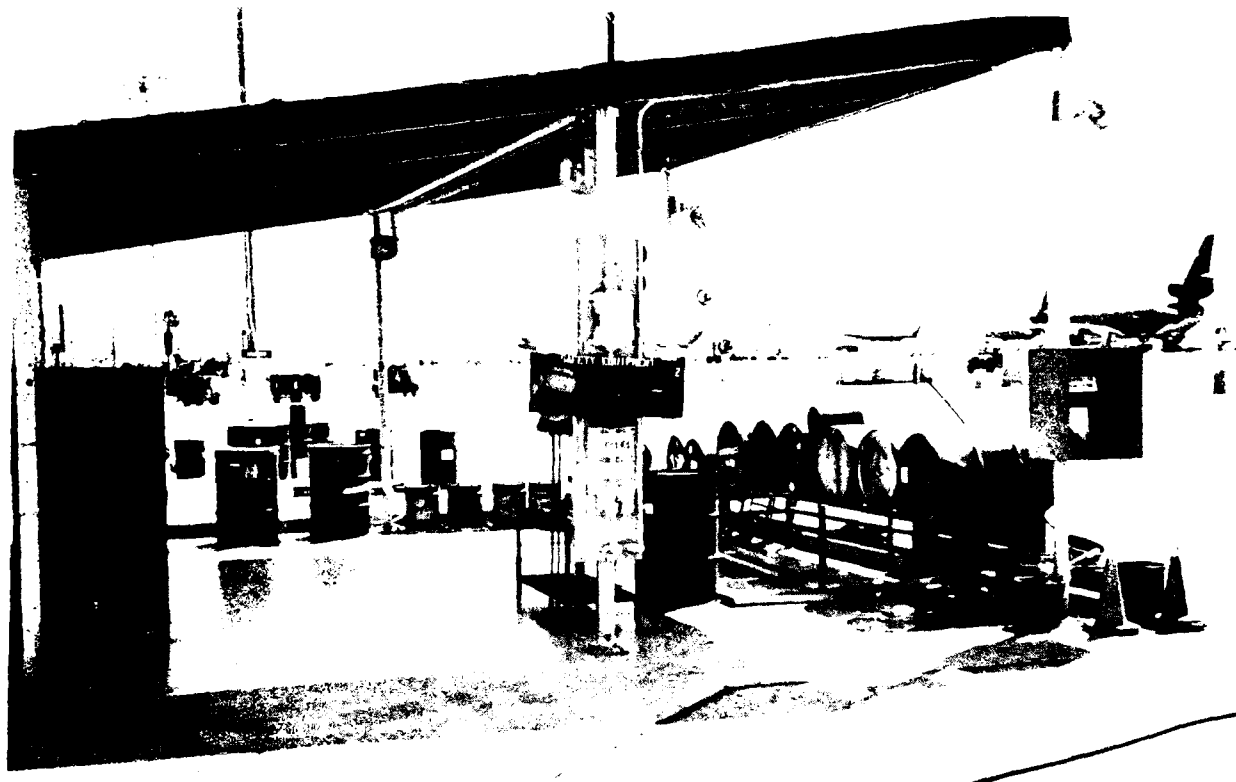


Figure 3. 22 FMS AGE Accumulation Site

Shop: Battery Shop
Contact: SSgt Golemis

Building: 1201
AUTOVON: 947-2058

Battery Shop personnel are responsible for removing battery acid from spent lead-acid batteries and neutralizing the used battery casings. Unneutralized waste acid is drummed and stored outside the facility. Wastewater from the sodium bicarbonate neutralization bath used to neutralize the battery casings is also drummed and stored next to the spent acid. After neutralization with baking soda, the battery casings are shorted out prior to disposal through DRMO. The shop services approximately 5 to 15 batteries per month.

SSgt Golemis is responsible for the accumulation site (Figure 4) located outside the facility. The accumulation site was not secured, diked, covered or on an impermeable surface. There were two drums being stored at the site. One drum contained 95 percent acid; the other drum contained 95 percent water. The drum containing the water had never been tested for hazardous waste characteristics.

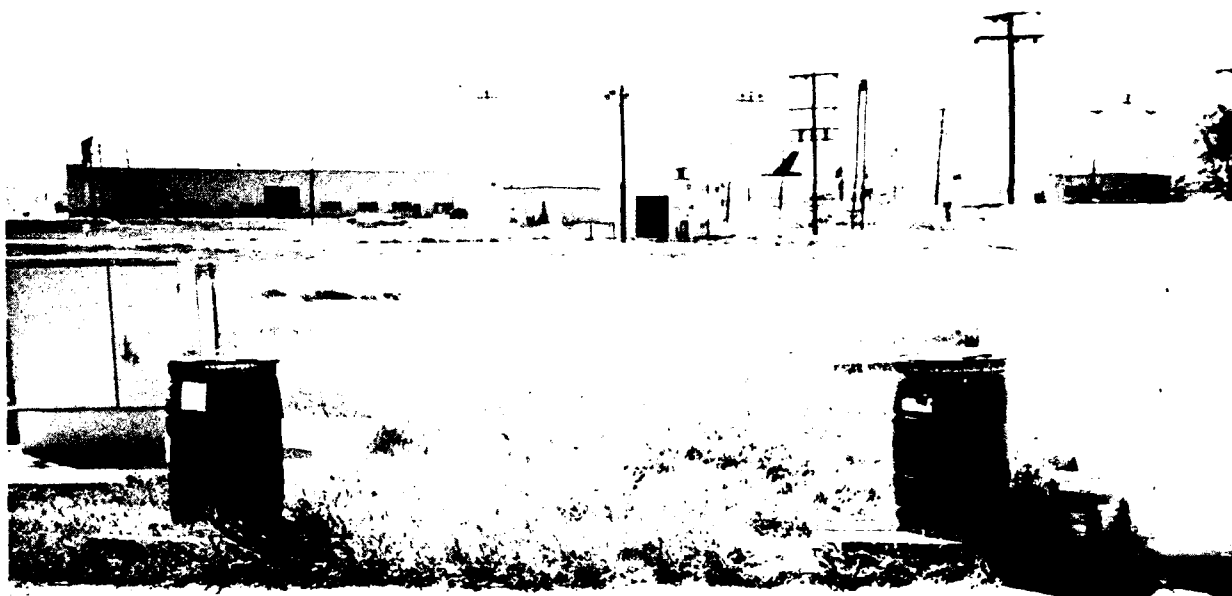
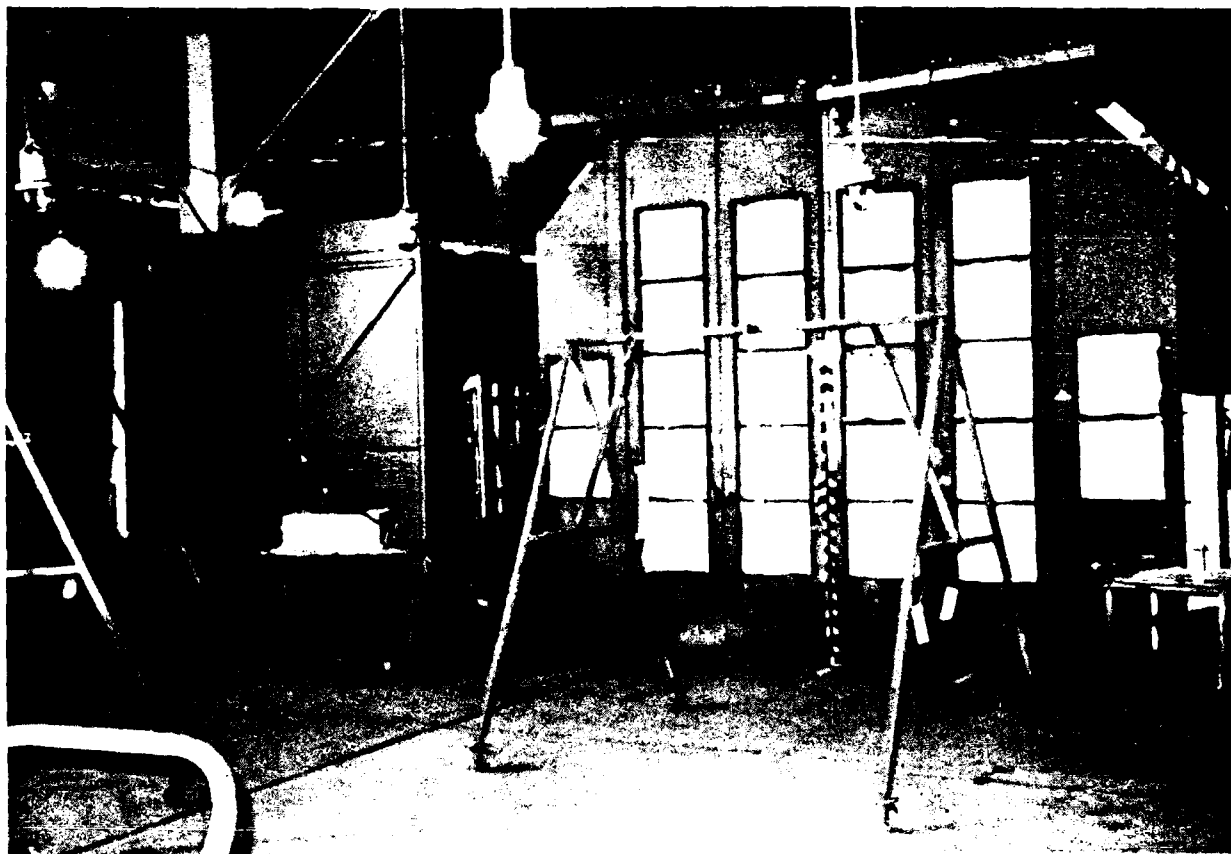


Figure 4. 22 FMS Battery Shop Accumulation Site

Shop: 22 FMS Corrosion Control
Contact: TSgt Zaiger

Building: 452
AUTOVON: 947-3845

The 22 FMS Corrosion Control shop is utilized by 452 CAMS, 943 CAMS, and 163 CAMS. Shop personnel are responsible for protecting metal parts. Operations include painting, chemical stripping, glass bead blasting, and acid treating. The shop contains a waterfall paint booth, a glass bead blasting unit, a new plastic media bead blasting unit (purchased in 1983) which is inoperative, several stripping tanks, an alodine tank, and a PD-680 degreasing tank, also not used because of air quality permit problems. The paint booth and plastic media bead blasting unit are shown in Figure 5.



**Figure 5. Waterfall Paint Booth and Plastic Media
Bead Blasting Unit**

The waterfall paint booth is cleaned out weekly. The solids are skimmed off and disposed of in the trash. Wastewater from the waterfall paint booth discharges to a sump used for settling paint sludge. The sludge in the sump is periodically shoveled out by shop personnel. Neither the sludge nor wastewater has been tested for hazardous waste characteristics. The paint booth air filters are also thrown into the trash without analytical testing. Waste glass bead blasting media is also thrown into the trash without being tested for hazardous waste characteristics. The plastic media bead blasting (PMBB) unit lacks a compressor. According to TSgt Zaiger, use of the PMBB unit would cut chemical stripper usage by 50 percent.

The stripping and cleaning area is located in a fenced area outside Building 452 (Figure 6). This area contains a hot stripper tank, a cold stripper tank, an alodine tank and a PD-680 degreasing tank. The base is waiting for the receipt of an air quality permit before using the PD-680 tank. The 150-gallon hot stripper tank which normally contains B&B 9201 was not in operation at the time of the survey. The 440-gallon cold stripper tank contains B&B 162E which is changed out every two to two-and-a-half years. The 30-gallon alodine tank is changed out every couple of months. The waste strippers and alodine solution are drummed and stored at the Building 452 Accumulation Site before being transported to the FMS Central Accumulation Site (Building 1203).

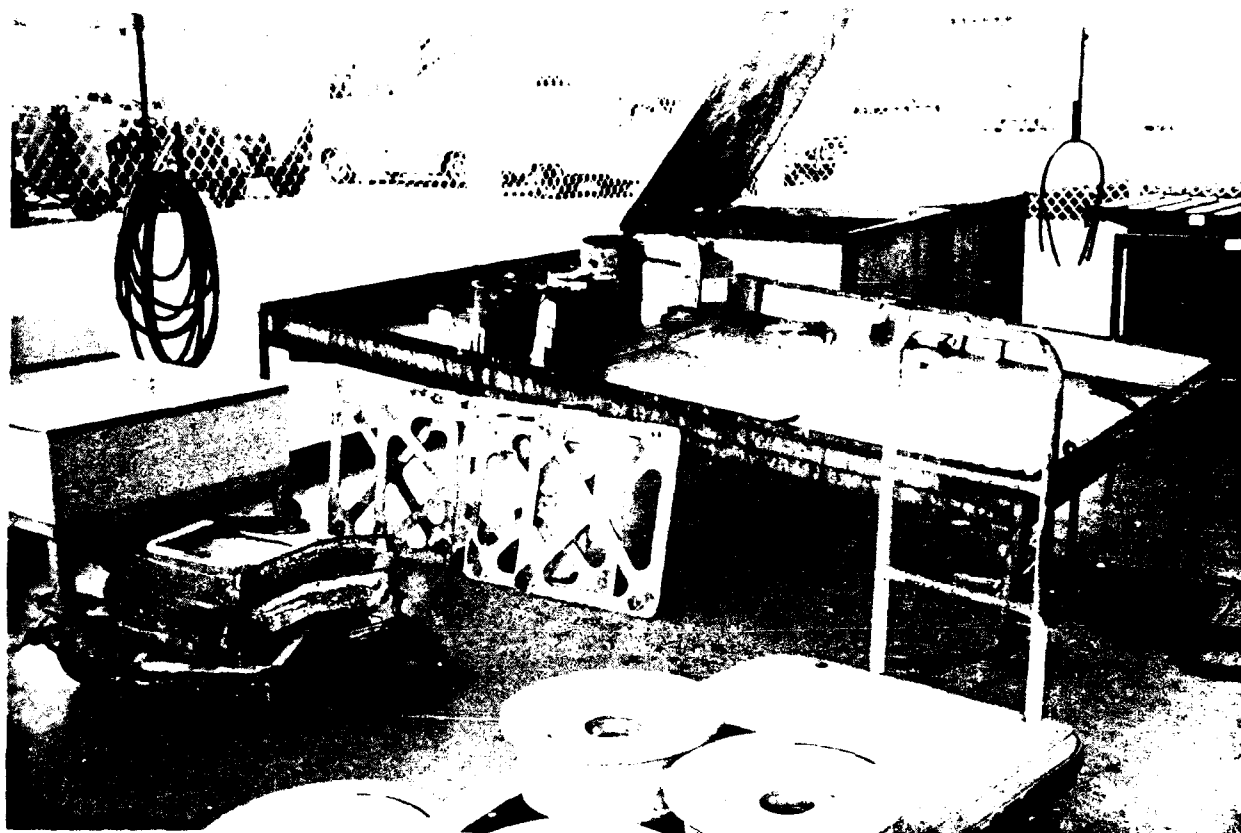


Figure 6. Corrosion Control Stripping Area

TSgt Zaiger is the accumulation site manager for the Building 452 Accumulation Site. He keeps a log of the hazardous wastes stored at his facility and organizes waste transportation to the FMS Central Accumulation Site when five or six drums of waste are accumulated.

The shop maintains a satellite accumulation site for paint wastes behind the building for convenience. When a drum is full, it is transported to the Building 452 Accumulation Site for disposal with the other hazardous waste drums. Lt Cafiso fills out the DD Form 1348-1 for the Corrosion Control Shop and ultimately contacts Lt Bachand for the contractual disposal of the waste.

The Building 452 Corrosion Control Accumulation Site (Figures 7 and 8) seemed in good condition. The site was secured, on an impermeable surface and contained drums that were in good condition. However, the facility lacked proper fire and spill protection equipment and warning signs identifying the name and telephone number of the accumulation site manager.



Figure 7. Corrosion Control Accumulation Site, Inside View



Figure 8. Corrosion Control Accumulation Site, Outside View

Shop personnel operate a satellite corrosion control shop at Building 2309 (Figure 9). The satellite shop contains a hot stripping tank, an aluminum stripping tank, and a hot soap tank. The hot stripping tank (165 gallons) contains B&B 9201 and is cleaned out every six months. The aluminum stripping tank contains approximately 40 gallons of B&B 162e (a very aggressive stripper) and is changed out every six months. The hot soap tank was being used to test two B&B soap products (B&B 2030 and 2034) that could replace PD-680. TSgt Fortune said that B&B 2034 works very well and he prefers it over PD-680. He also said that B&B 2030 was too strong. Methyl Ethyl Ketone (MEK, 20 gallons per month) is used in a wipe-on wipe-off operation. All wastes are drummed and stored at the 22 FMS Corrosion Control Accumulation Site.

Shop: Electrical and Environmental Systems Building: 1201
Contact: TSgt Young AUTOVON: 947-5281

Shop personnel are responsible for the maintenance and repair of electrical and environmental systems of KC-135 and KC-10 aircraft. Any small amounts of solvents and cleaners are used up in process. No hazardous wastes are generated.

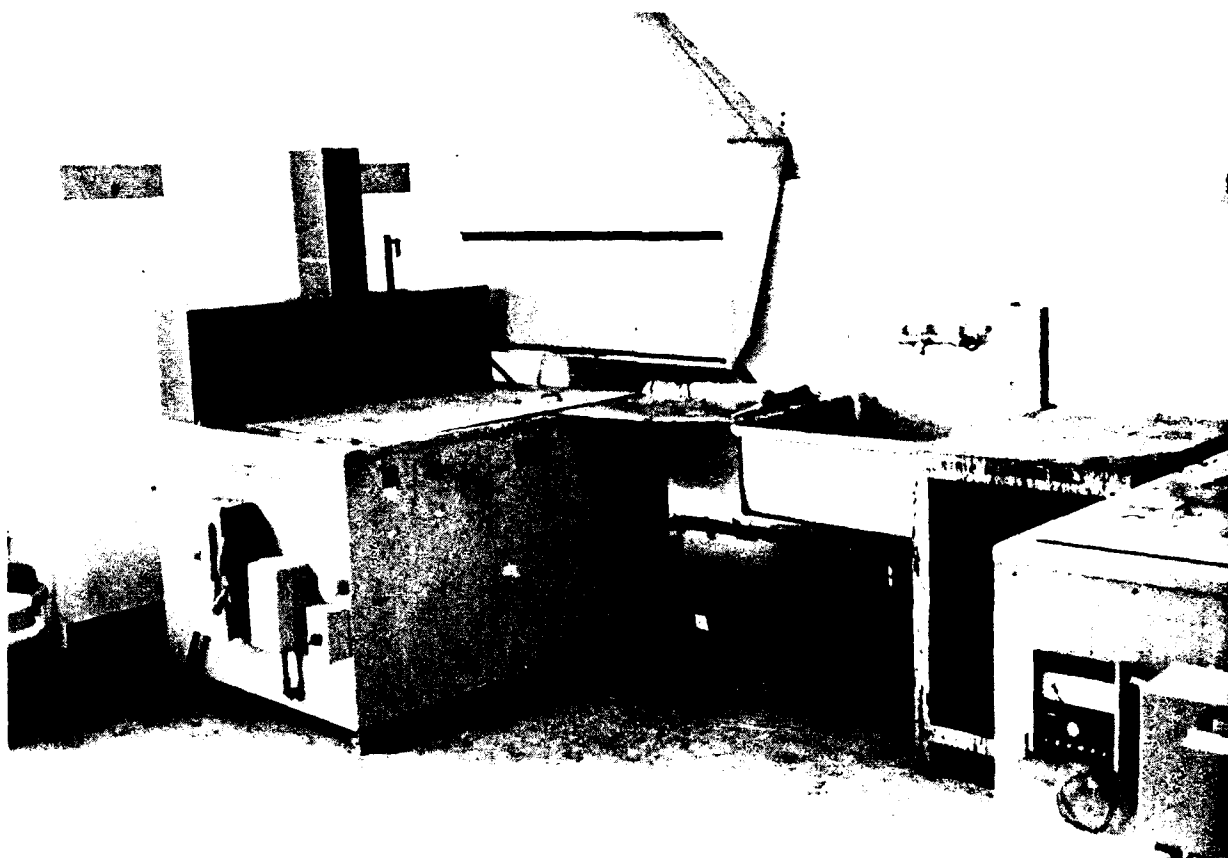


Figure 9. Satellite Corrosion Control Site (Building 2309)

Shop: Fuel Systems Building: 1244
Contact: MSgt Lampierre AUTOVON: 947-3060

Shop personnel are responsible for the repair and maintenance of KC-135 and KC-10 aircraft fuel systems. Fuel is collected from the systems with vacuums and disposed of in flight line bowlers. Uncontaminated fuel is reused. No hazardous wastes are generated.

Shop: Jet Engine Maintenance
Contact: TSgt Weeks

Building: 1203
AUTOVON: 947-2850

Shop personnel are primarily responsible for tearing down and re-building jet engines. They also perform standard maintenance, bearing cleaning and repair, and engine testing. Shop personnel exercise spill prevention techniques such as keeping catch pans underneath engines. The portion of the shop that generates hazardous waste is the bearing room. The bearing room has four cleaning vats (3-4 gallons each) containing 7808 oil, fingerprint remover, PD-680 and carbon remover. The contents of the vats are changed every 30 days. Wastes are drummed and stored at the Central Accumulation Site, Building 1203.

The Jet Engine Test Cells are operated by the Jet Engine Maintenance Shop. No hazardous wastes other than oily rags are generated.

Shop: Machine Shop/Structural Repair/Welding Building: 453
Contact: TSgt Brewster/TSgt Gadue AUTOVON: 947-4192

The Machine Shop is shared with 943 CAMS; the Structural Repair Shop is shared with 452 CAMS and 942 CAMS; and the Welding Shop is shared with 163 ANG and 943 CAMS. Shop personnel are responsible for fabrication and repair of metal aircraft parts. The shops do not generate any hazardous waste other than oily rags. Spray cans of Methyl Ethyl Keytone (MEK), used in a wipe on degreasing operation, are thrown away. The shops generate approximately one drum of oily rags per month.

Shop: NDI
Contact: SSgt Brown

Building: 1238
AUTOVON: 947-4279

The 22 FMS NDI Shop is shared with 452 CAMS, 943 CAMS and 163 ANG. Shop personnel are responsible for the inspection of aircraft components by utilizing penetrant, magnetic particles, ultrasound, x-ray and eddy current methods. The shop contains a 110-gallon penetrant tank, 110-gallon emulsifier tank, 110-gallon developer tank, 5-gallon bath solution tank, and a dark room which contains fixer, developer, old film, and a new automatic film processor.

The magnetic particle inspection system utilizes a petroleum based oil and iron filings with a large magnet to find flaws in aircraft parts. Approximately 20 gallons of petroleum oil is drained from the unit into four 5-gallon cans every six months. The cans are disposed of through the Building 1203 Accumulation Site.

The penetrant inspection process (Figure 10) is an open system which uses a penetrant, emulsifier, and a rinse. Parts are sequentially dipped into the penetrant, emulsifier, and rinse bath and allowed to drip dry. Parts are then sprayed with a developer and passed through a drying oven prior to inspection and final rinse. The penetrant tank contains 100 percent penetrant and is changed every two years. This waste is drummed and transported to the Building 1203 Accumulation Site for disposal. The emulsifier tank containing 30 percent emulsifier and 70 percent water are drained about every two years into drums and transported to the Building 1203 Accumulation Site. The

developer tank contains a mixture of dry developer (water soluble) and water. The contents are drummed and transported to the base Photo Lab where it is poured down the drain. The penetrant inspection equipment is shown in Figure 11.

The Dark Room chemicals are currently transported to the base Photo Lab for silver recovery and disposal. A new film processor containing a built-in silver recovery system should be operational within a month.

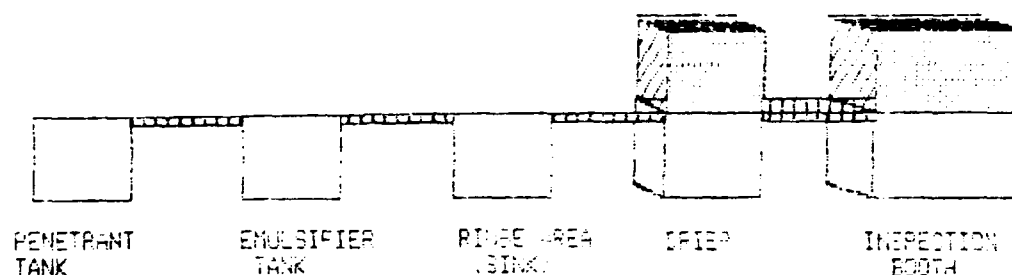


Figure 10. Graphic Representation of Penetrant Inspection Process



Figure 11. NDI Shop Penetrant Inspection Equipment

Shop: Pneudraulics
Contact: TSgt Peterson

Building: 1203
AUTOVON: 947-2383

Shop personnel are responsible for cleaning and testing hydraulic system components. The shop has one hydraulic test unit. Five gallons of waste hydraulic fluid are drained from the unit monthly, drummed, and stored at the Building 1203 Accumulation Site. Corrosion Prevention Compound (CPC) is sprayed on brake parts; empty cans are thrown in the trash. The shop generates small amounts of oily rags that are drummed and disposed of as hazardous waste.

Shop: Repair and Reclamation
Contact: TSgt Teague

Building: 1246
AUTOVON: 947-4132

Shop personnel remove and replace flight controls and landing gear from KC-135 and KC-10 aircraft during normal phase maintenance. They are also in charge of tearing down and building up KC-135 wheel and tire assemblies. The wheel and tire area contains three PD-680 tanks (Figure 12) that have a combined capacity of 275 gallons (two 110-gallon tanks and one 55-gallon tank). The tank contents are emptied every six months, drummed and stored at the Building 1203 Accumulation Site. The only other wastes generated by the shop are small amounts of hydraulic fluid (approximately 2 gallons per month) drained from the aircraft flight controls and oily rags (approximately 1 drum per month). Both the hydraulic fluid and rags are drummed and disposed of through the Building 1203 Accumulation Site. Spills are cleaned up with an absorbant (Speedy Dry) and drummed with the oily rags.



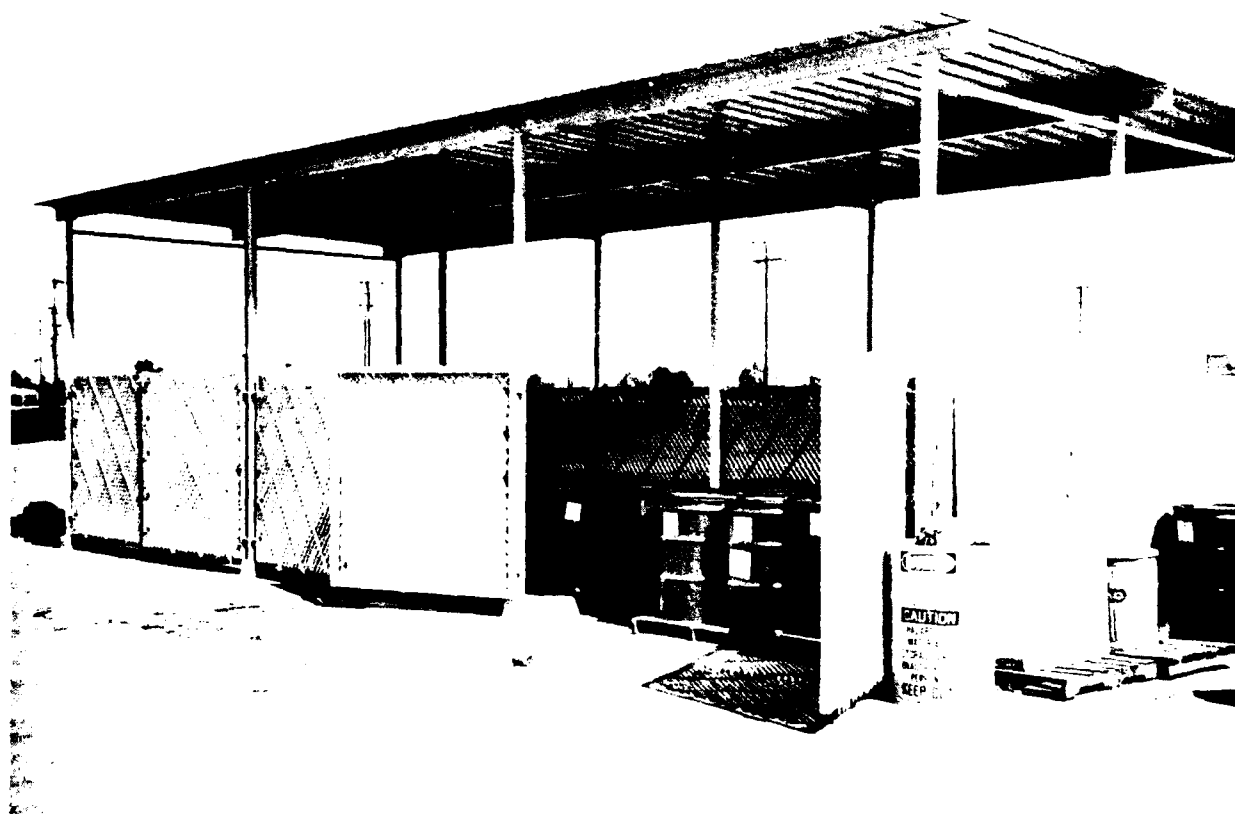
Figure 12. Wheel and Tire Shop PD-680 Tan.

FMS Central Accumulation Site
Site Manager: Lt Cafiso

Building: 1203
AUTOVON: 947-2871

Lt Cafiso is the accumulation site manager for the FMS Central Accumulation Site, Building 1203, and SSgt Snyder is her assistant. Together they keep a detailed log of the waste that passes through the facility. They have established a policy of accepting wastes at the accumulation site for one hour per day, three days per week. They also give an annual briefing to each work center on hazardous material and hazardous waste handling.

The central accumulation site (Figure 13) was in good condition. Drums being stored at the facility appeared to be in good condition. However, the site lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs identifying the name and telephone number of the accumulation site manager. Approximately 25 drums of oily rags (Figure 14) were being stored outside the facility at the time of the survey. Lt Cafiso said that DRMO had not made a hazardous waste pick up in six months.



Figures 13. 22 FMS Central Accumulation Site, View 1



Figure 14. 22 FMS Central Accumulation Site, View 2

C. 22 CES

Contact: Lt Bachand

AUTOVON: 947-2001

Shop: Entomology

Building: 2507

Contact: TSgt Guillebeaux

AUTOVON: 947-3177

The CES Entomology Shop personnel are responsible for basewide pest management and weed control. Pesticides and herbicides employed are used up in process. Rinsate from equipment cleaning is containerized and reused when a new batch of chemical is prepared. Empty chemical containers are triple rinsed, punctured and thrown in the trash. Shop personnel are currently storing outdated poisonous chemicals (three or four pounds) in a locker. They stated that they were having difficulties getting rid of the chemicals.

Shop: Exterior Electric
Contact: MSgt Lucas

Building: 2507
AUTOVON: 947-2252

Shop personnel are responsible for the repair and maintenance of all outside electrical systems up to 35,000 volts. The crew spends only 10 percent of their time in the shop. They are currently investigating PCB contaminated transformer removal/reduction proposals. There are 36 known PCB transformers on base that have a PCB concentration greater than 500 ppm. One of the proposed PCB reduction proposals is from the Unisom Corporation. However, the Unisom process only guarantees to reduce PCB concentrations to below 50 ppm while SAC wants to reduce the level to 5 ppm (California's regulation). The shop generates no hazardous waste.

Shop: Metal Welding
Contact: Mr Quiroz

Building: 2507
AUTOVON: 947-4988

Shop personnel are responsible for the brazing and welding of metal parts. All fluxes and solvents employed are used in process. The shop generates no hazardous waste.

Shop: Protective Coatings
Contact: Mr Rowe

Building: 2505
AUTOVON: 947-5121

Shop personnel are responsible for painting on base (e.g., buildings, signs). The shop operates a waterfall paint booth. Wastewater from the booth is discharged to the sanitary sewer and air filters from the booth are disposed of as municipal waste without prior analysis for hazardous waste characteristics. Paint chips and sludge from the booth are drummed and stored at the CES Accumulation Site located at Building 2508.

The California Air Resources Board (CARB) has recently put new restrictions on the use of solvent based paints. The state currently does not allow oil based finishes with a solvent content greater than 250 ppm to be produced or applied. The penalty for violating the regulation could be as much as \$25,000 plus six months in jail.

Shop: Liquid Fuels Maintenance
Contact: Mr Nutt

Building: 457
AUTOVON: 947-2056

Shop personnel are responsible for maintaining liquid fuel distribution systems and are contacted whenever a fuel spill occurs. If the spill is large, the Fire Department takes care of it. Otherwise, shop personnel are responsible for cleaning it up. Large fuel storage tanks are cleaned every five to eight years, depending on tank size. Cleaning is mainly done by contract. Any residual is pumped out and disposed of by the contractor. This shop generates no hazardous waste.

CES Accumulation Site
Site Manager: Mr Rowe

Building: 2505
AUTOVON: 947-5121

The CES Accumulation Site (Figure 15) was not covered and not on an impermeable surface, diked or bermed, or secured. It lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs identifying the name and telephone number of the accumulation point manager.

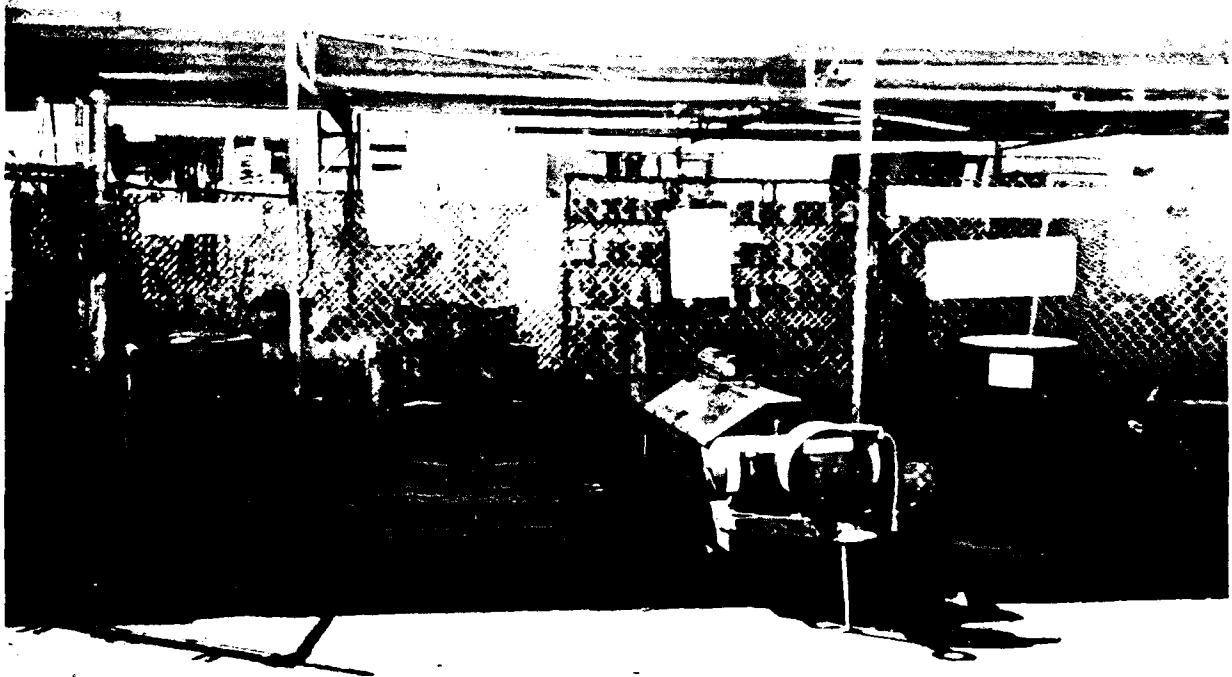


Figure 15. 22 CES Accumulation Site

D. 22 OMS

Shop: Tanker Phase Maintenance

Building: flight line
washrack

Contact: MSgt Carter

AUTOVON: 947-4160

Shop personnel wash and inspect KC-135 and KC-10 aircraft. Small amounts of waste fuel and oil are placed in flight line bowlers. PD-680 and aircraft cleaning compound are discharged to the sanitary sewer during normal aircraft cleaning operations. Oily rags are collected and disposed with oily rags from 22 FMS Phase Maintenance. The shop disposes no wastes through DRMO.

E. 22 CSG

Shop: Auto Hobby
Contact: Mr Hodges

Building: 941
AUTOVON: 947-2802

The Auto Hobby shop is a "garage type" facility which offers base personnel state-of-the-art automobile repair equipment and expert mechanical advice in automotive repair procedures. The shop rents space and tools to base personnel who work on their own cars. In general, only minor automotive repairs such as oil changes and tune-ups are performed at the shop.

The shop has a Safety Kleen degreasing unit. In order to defray the cost of the unit, the shop charges customers two dollars to use it. The unit is changed out on a quarterly basis. Five-hundred gallons of waste oil and transmission fluid per month are stored in an underground storage tank which is pumped out by contract. Waste antifreeze is stored in a 400-gallon above ground tank (Figure 16). The tank had no lock and the antifreeze appeared to be contaminated with waste motor oil. Brake fluid is generated in small quantities (less than 1 gallon per month) and discharged to the sanitary sewer system. Shop personnel receive free rags from the base hospital and the base linen supply. Approximately 10 drums per month of waste rags are thrown away with the shop's municipal waste. Waste batteries are given to a local contractor at no charge. The shop has drums of solvents left over from before the use of the Safety Kleen degreasing unit. These need to be used up elsewhere.

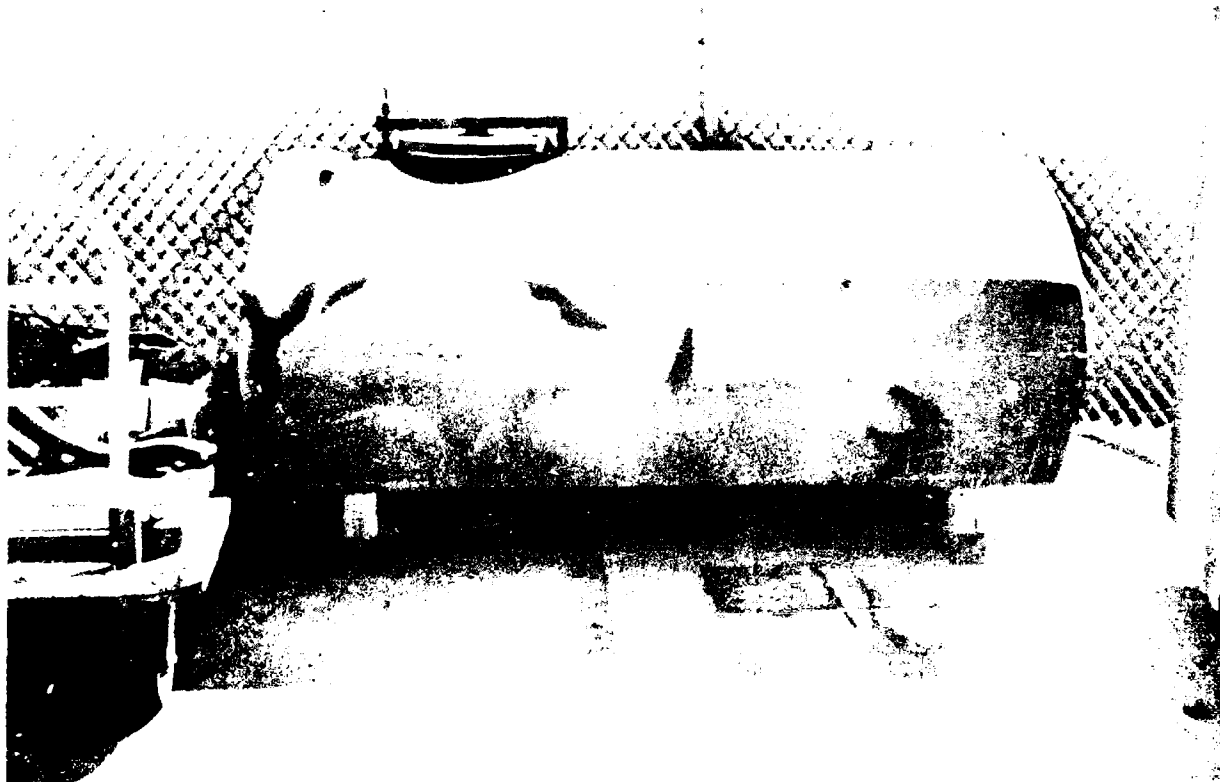


Figure 16. Auto Hobby Shop Waste Antifreeze Tank

Shop: Photo Lab
Contact: SSgt Scates

Building: 2630
AUTOVON: 947-4275

Lab personnel are responsible for processing and developing both color and black and white film. The shop uses both automatic and manual film processing techniques. Waste developer is discharged to the sanitary sewer while waste fixer is passed through an electrolytic silver recovery unit prior to discharge to the sanitary sewer system. The shop also disposes of a stabilizer containing formaldehyde through the sanitary sewer system.

F. 452 CAMS

Shop: AGE
Contact: Mr Hubbard

Building: 440
AUTOVON: 947-3353

452 CAMS AGE personnel service, repair, inspect and move flight line power and nonpower aerospace ground support equipment. Waste petroleum products comprise the majority of the waste generated. Waste oils (approximately 40 gallons per month) are stored in a 500-gallon bowser that is emptied at the base service station holding tank. Waste fluids are drummed and stored at the Building 440 Accumulation Site. PD-680 used on the washrack to clean parts (approximately 2 gallons per month) is rinsed down the drain.

The accumulation site (Figure 17) is located next to Building 440. The site was not secured, had no warning signs, spill or fire protection equipment. Drums being stored at the facility seemed to be in good condition. Mr Hubbard, the accumulation site manager, is responsible for filling out the DD Form 1348-1 for hazardous waste pickup.

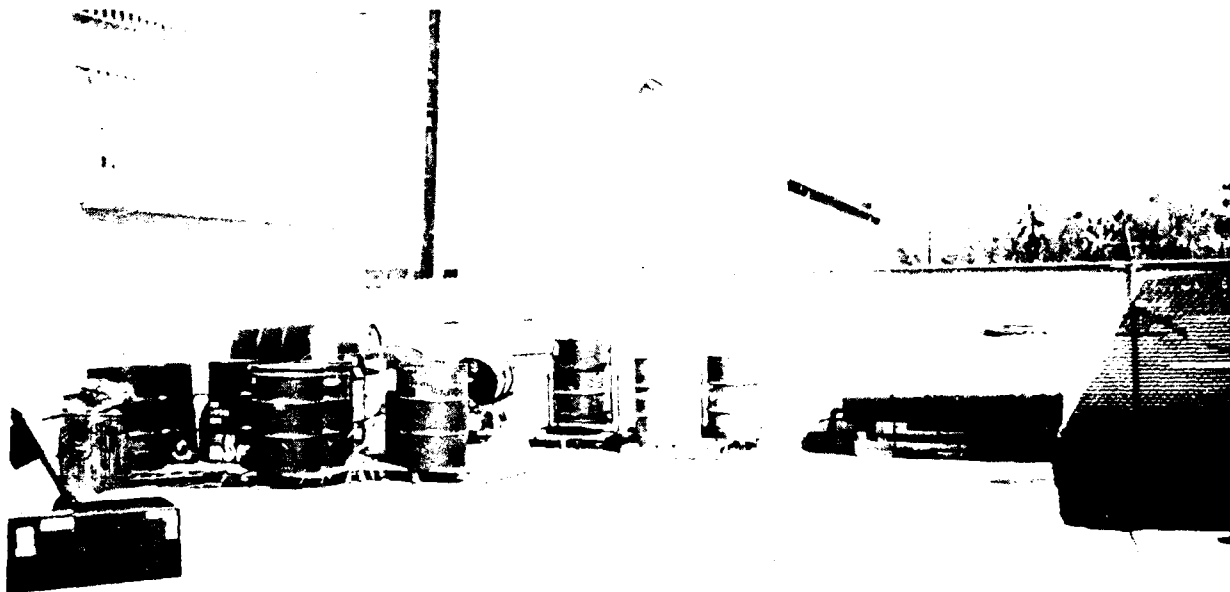


Figure 17. 452 AGE Accumulation Site

Shop: Aerospace Systems
Contact: Mr Kemp

Building: 2303
AUTOVON: 947-3534

Aerospace Systems is comprised of: Environmental Systems; Repair and Reclamation, Pneudraulics, Electric Avionics and Fuel Cell Repair shops. These shops do not generate much hazardous waste.

Environmental Systems and Avionics generate no hazardous waste. Repair and Reclamation Shop generates small amounts of oily rags. The rags are drummed and stored at the 452 CAMS Accumulation Site for disposal. The Electric Shop produces 5-6 waste NiCad batteries per month. The batteries are transported to the 22 FMS Battery Shop for disposal. The Pneudraulics Shop disposes of approximately two gallons of waste hydraulic fluid and 5 to 15 gallons of fuel per month. The hydraulic fluid is placed in a bowser, transported to the 452 CAMS Accumulation Site, drummed and disposed of as hazardous waste. Fuel is placed in one of two fuel bowzers. One bowser is used to store uncontaminated fuel for reuse while the other bowser is for contaminated fuel. The contaminated fuel is transported to the 452 CAMS Accumulation Site, Building 2306, drummed and disposed of as hazardous waste. The Fuel Cell Repair Shop generates less than 100 gallons per month of waste fuel. The fuel is drained from refueling booms during normal maintenance and repair procedures. The waste fuel is handled in the same manner as in the Pneudraulic Shop.

Two PD-680 tanks are utilized by all shop areas. The tanks contain a combined total of 60 gallons of solvent and are changed out every six months. Waste solvent is placed in a bowser, transported to the 452 CAMS Accumulation Site (Building 2306), and drummed for hazardous waste pickup.

Shop: Phase Dock
Contact: Mr Witt

Building: 2307
AUTOVON: 947-5342

Shop personnel are responsible for the normal phase maintenance of KC-135 aircraft. Petroleum wastes are the only hazardous wastes generated during normal phase maintenance processes. Hydraulic fluid (5 gallons) and oil (22 quarts) are drained from aircraft into a bowser, transported to the 452 CAMS Accumulation Site, drummed and disposed of as hazardous waste. Any fuel remaining in fuel lines is drained into either a contaminated or uncontaminated fuel bowser. Contaminated fuel is transported to the accumulation site, drummed and disposed of as hazardous waste.

Shop: Propulsion
Contact: SMSgt Benson

Building: 458
AUTOVON: 947-3314

The 452 CAMS Propulsion Shop is shared with the 163 ANG Propulsion Shop. 452 CAMS Shop personnel are responsible for the normal repair and maintenance of KC-135, TF33PW102, Turbofan aircraft engines. The majority of wastes generated at this shop are petroleum products. These products, including waste oil, hydraulic fluid (2 gallons each per month), and waste fuel, are placed in a bowser, transported to the 22 OMS Accumulation Site (Building 440), drummed and stored. The shop operates a small PD-680 degreasing unit (approximately 10 gallons). The unit is changed out

semiannually. The waste solvent is placed in the OMS mixed solvent drum and held at the OMS Accumulation Site for pick up by contractor. Oily rags (approximately 1/3 drum per month) are stored at a new accumulation site behind Building 458 for contractor pick up.

The new accumulation site (Figure 18) behind Building 458 had no formally designated site manager and was not secured during the visit. The waste drums were on an impermeable, diked surface and a valve existed to drain water from the facility. Drums being stored at the facility seemed to be in good condition. However, the facility lacked proper fire protection, spill prevention equipment, and warning signs identifying the name and telephone number of the site manager. It was not clear who was responsible for filling out the DD Forms 1348-1 and contacting Lt Bachand when a hazardous waste pickup was needed.

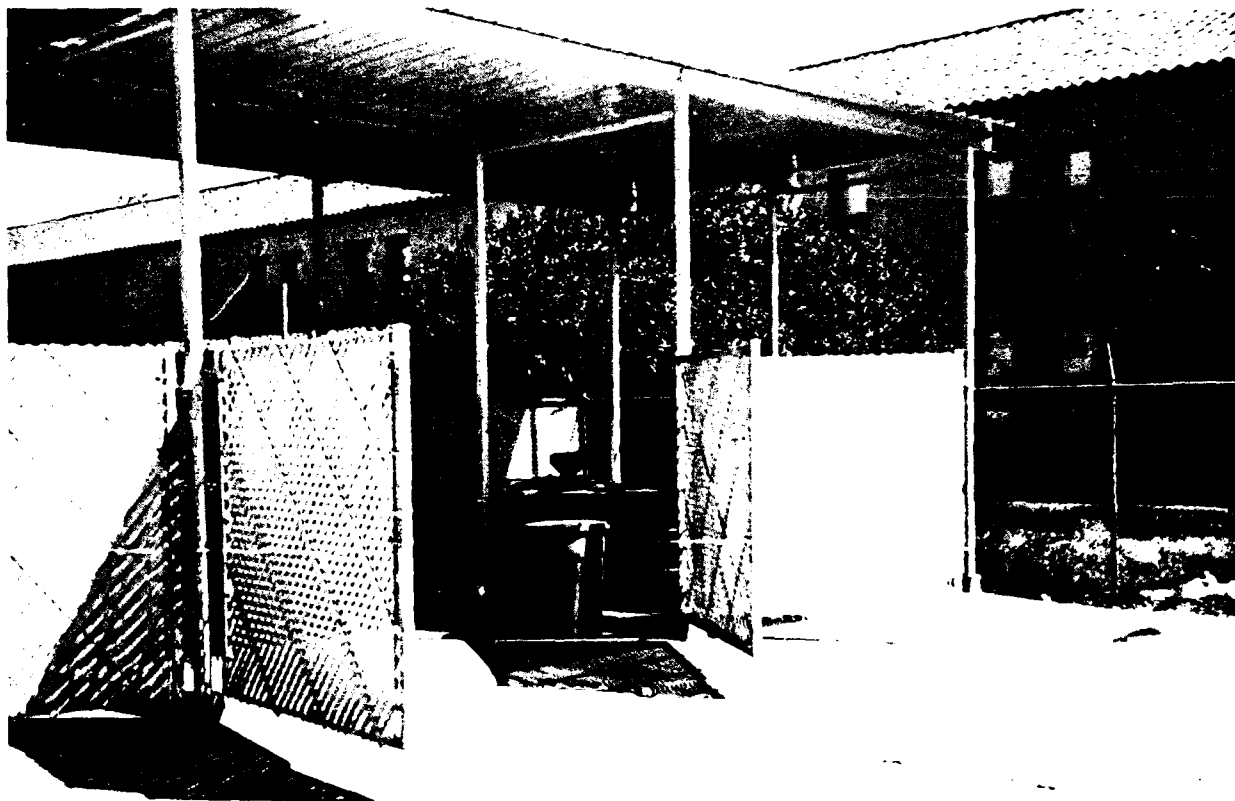


Figure 18. 452 Propulsion Accumulation Site

452 CAMS Accumulation Site
Site Manager: MSgt Holman

Building: 2306
AUTOVON: 947-3740

MSgt Holman is the manager for the 452 CAMS Accumulation Site. He keeps a waste log and assigns a unique number to each waste that passes through the facility. To prevent midnight dumping, MSgt Holman keeps the facility locked. Personnel must contact him in order to leave wastes at the site. He fills out the DD Form 1348-1 and contacts Lt Bachand when a hazardous waste pickup is needed. MSgt Holman said that he receives 90 percent of his oil/fuel wastes from flight line maintenance bowzers. Contaminated fuel is stored at the base service station while uncontaminated fuel is reused by the AGE shop after the base fuels lab has finished testing. The accumulation site manager took a two day base class on how to run an accumulation site.

The accumulation site (Figure 19) was only three months old and in good condition. Drums being stored at the facility seemed to be in good condition. However, the site lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs identifying the name and telephone number of the accumulation site manager. MSgt Holman said that DRMO had not made a hazardous waste pick up in several months.

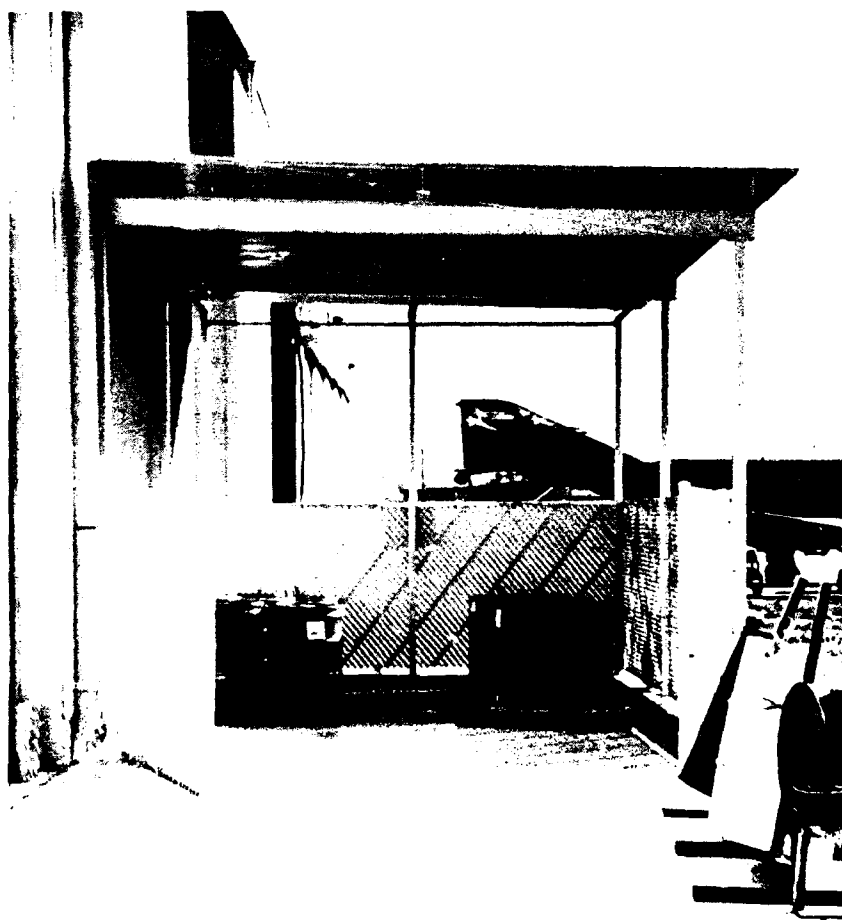


Figure 19. 452 CAMS Central Accumulation Site

G. 943 CAMS

Shop: Propulsion
Contact: Mr Gonzalez

Building: 2303
AUTOVON: 947-2273

943 CAMS Shop personnel are responsible for normal repair and maintenance of KC-10 aircraft engines. The majority of waste generated at this shop is engine oil from engine oil changes. Waste oil (24 gallons per month) is drummed, transported to the 943 CAMS Accumulation Site (Building 2307), and stored. Wastes are picked up by a contractor. The shop utilizes a small PD-680 (about 20 gallons) degreasing unit to clean parts. The unit contains about 15 gallons of PD-680 and is changed out quarterly. Waste solvent is drummed and stored at the 943 CAMS Accumulation site. Oily rags (approximately 80 pounds per month) are drummed and stored at the 943 CAMS Accumulation Site.

A new accumulation site behind Building 2303; (Figure 20) is not being utilized. The facility was in good shape and might prove to be a better accumulation site than the Building 2307 facility. The new accumulation site has an impermeable, diked surface, a valved drainage system, a cover and was secured. However, the facility lacked proper fire protection and spill prevention equipment and warning signs identifying the name and phone number of the accumulation site manager.



Figure 20. Building 2303 Accumulation Site

Shop: Phase Dock
Contact: Mr Spurbeck

Building: 2307
AUTOVON: 947-4575

Shop personnel are responsible for the normal phase maintenance of C-130 aircraft. Petroleum wastes are the only hazardous wastes generated during normal maintenance. Hydraulic fluid (25-30 gallons) and synthetic oil (55 gallons) are drained from aircraft, drummed, transported to the 943 CAMS Accumulation Site and disposed of as hazardous waste. Any fuel remaining in fuel lines is drained into either a contaminated or uncontaminated fuel bowser. Contaminated fuel is transported to the accumulation site, drummed and disposed of as hazardous waste.

Shop: Pneudraulics/Environmental Systems
Contact: Mr Mullens

Building: 2307
AUTOVON: 947-5256

The Pneudraulic Shop shares space with the Environmental Systems Shop. Shop personnel are responsible for cleaning and testing hydraulic system components and environmental systems. The shop has one hydraulic test unit. Nine gallons of hydraulic fluid are drained from the unit monthly, drummed and stored at the 943 CAMS Accumulation Site. The shops operate two PD-680 degreasing tanks. The small 30-gallon PD-680 bearing degreaser tank is located inside the office area. The tank will not operate unless the lid is closed. A large 150-gallon PD-680 degreasing tank is kept outside the office area in the hangar. The tank is kept locked. Both tanks are changed out annually. Waste PD-680 is drummed and stored at the 943 CAMS Accumulation Site for disposal as hazardous waste. The shop generates small amounts of oily rags which are drummed and disposed of as hazardous waste.

Shop: Fuel Systems
Contact: Mr Vaughn

Building: 2307
AUTOVON: 947-5256

Shop personnel are responsible for repairing and maintaining fuel systems in the C-130 aircraft. Fuel drained from aircraft (approximately 20 gallons per month) is placed in a bowser and transported to the base service station where it is stored in an underground fuel storage tank. Waste fuel is picked up by a contractor. The shop generates small amounts of oily rags which are drummed and stored at the 943 CAMS Accumulation Site as hazardous waste.

Shop: 943 AGE
Contact: Mr Copeland

Building: 440
AUTOVON: 947-2386

AGE personnel service, repair, inspect and use flight line power and nonpower aerospace ground support equipment. Waste petroleum products comprise the majority of the waste generated. Waste oils (approximately 20-25 gallons per month) are stored in a 200-gallon bowser. The petroleum waste bowser is transported to the base service station by the 943 CAMS and is emptied at the POL holding area. The shop utilizes a 10-gallon PD-680 unit which is changed out once every six months. Waste PD-680 is drummed and stored at the Building 440 Accumulation Site.

The accumulation site is located next to Building 440 and is used by 452 CAMS, 943 CAMS and 163 ANG. The site was not secured, had no warning signs, spill or fire protection equipment. Drums being stored at the facility were in good condition. Mr Hubbard, the accumulation point manager, is responsible for filling out the DD Forms 1348-1 whenever a hazardous waste pickup is needed.

943 CAMS Accumulation Site
Site Manager: Mr Mullen

Building: 2307
AUTOVON: 947-5256

Mr Mullen is the site manager for the 943 CAMS Accumulation Site. He inspects the site weekly and gives a waste management/training course semiannually. The accumulation site manager is in charge of filling out DD Forms 1348-1 and contacting Lt Bachand for hazardous waste pickups. Unfortunately, Mr Mullen has had difficulty getting a disposal contractor to pick up the wastes through DRMO. The last waste pick up was over a year ago. There were approximately 30 drums located at the site during the survey.

The accumulation site (Figure 21) was not in good condition. The site was not secured, covered, or diked, and lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs identifying the name and telephone number of the accumulation site manager. Drums being stored at the facility seemed to be in good condition. Mr Mullen said that he has experienced problems with mixed wastes in the past.



Figure 21. 943 CAMS Accumulation Site

H. 163 ANG

Shop: Munitions Maintenance
Contact: SMSgt Smith

Building: 2315
AUTOVON: 947-956

Shop personnel are responsible for the repair and maintenance of weapons and weapon delivery systems utilized by the F-4E aircraft. The shop contains a 50-gallon aircraft soap tank and a 50-gallon PD-680 degreasing tank. The soap tank is changed out semiannually while the solvent tank is changed out quarterly. These liquid wastes are drummed separately and stored outside the facility in an open area parking lot which serves as an accumulation site. The shop also generates waste oily rags which are placed in plastic bags and thrown in the trash. Cans of spray paint for minor spot painting are thrown in the trash.

The Building 2315 parking lot accumulation site (Figure 22) was not covered, on an impermeable surface, diked or bermed, or secured and lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs identifying the name and telephone number of the accumulation site manager. Drums being stored at the facility were on pallets and seemed to be in good condition. SMSgt Smith said that he was having difficulty getting DRMO to pick up the waste located at his site (4 drums of PD-680; 1 drum of soap; and 1 empty drum). The waste has been stored at the site for over four months.

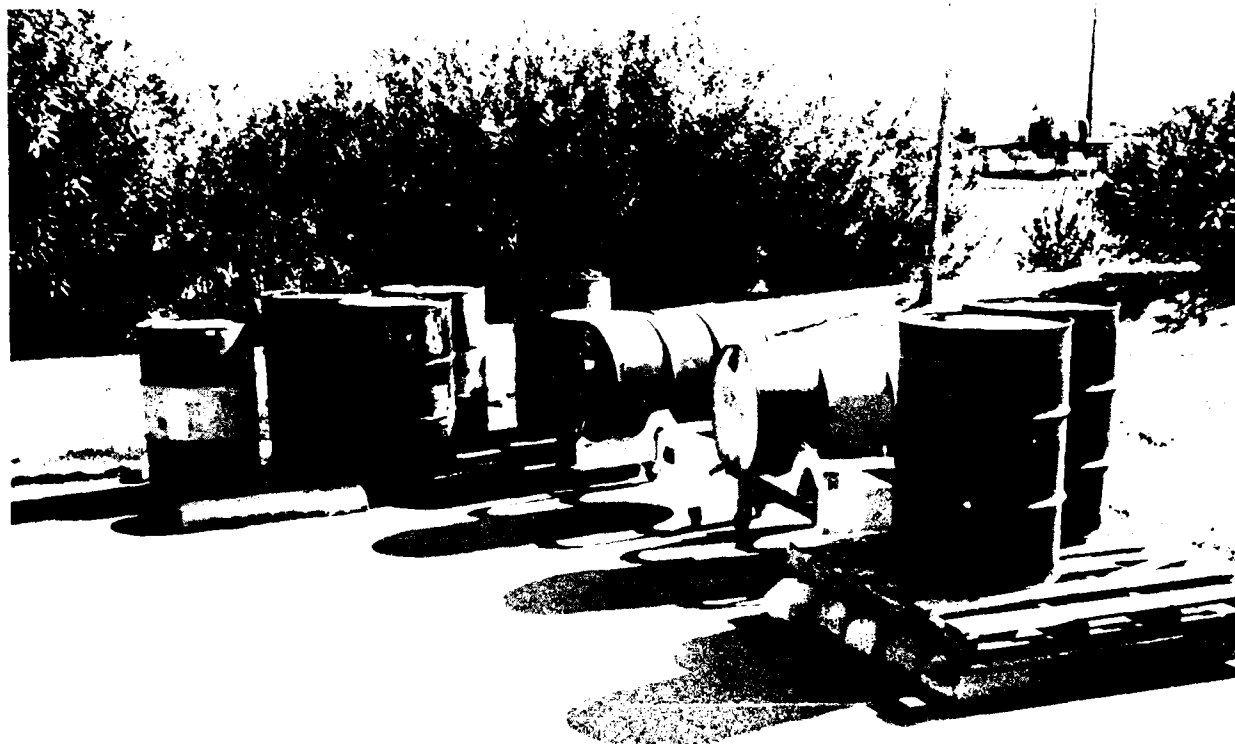


Figure 22. 163 Munitions Accumulation Site

Shop: Transportation/
Vehicle Maintenance
Contact: MSgt Shane

Building: 2274
AUTOVON: 947-4066

Shop personnel are responsible for repairing vehicular body components, painting, and performing normal maintenance on ANG vehicles. Shop operations include sanding, welding, small amounts of stripping, painting, degreasing and normal routine vehicle maintenance such as oil changing. The shop operates a 35-gallon PD-680 tank for degreasing but is in the process of replacing the tank with a Safety Kleen Degreasing unit. Waste PD-680 is drummed and stored at the transportation accumulation site. Waste oil (approximately 50 gallons per month) is stored in a 600-gallon above ground tank. The tank is supposed to be pumped out by contractor through DRMO but has not been pumped out in over a year. Waste synthetic oil is drummed and stored at the transportation accumulation site for hazardous waste pick up. Oily rags and filters are drummed, stored at the accumulation site for 22 TRANS and disposed of as hazardous waste. The shop utilizes a dry paint booth. The practice for the disposal of paint booth filters was not known at the time of the survey.

The accumulation site (Figure 23) was not secured, covered, or diked, and lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs identifying the name and telephone number of the accumulation site manager. Drums being stored at the facility appeared to be in good condition.

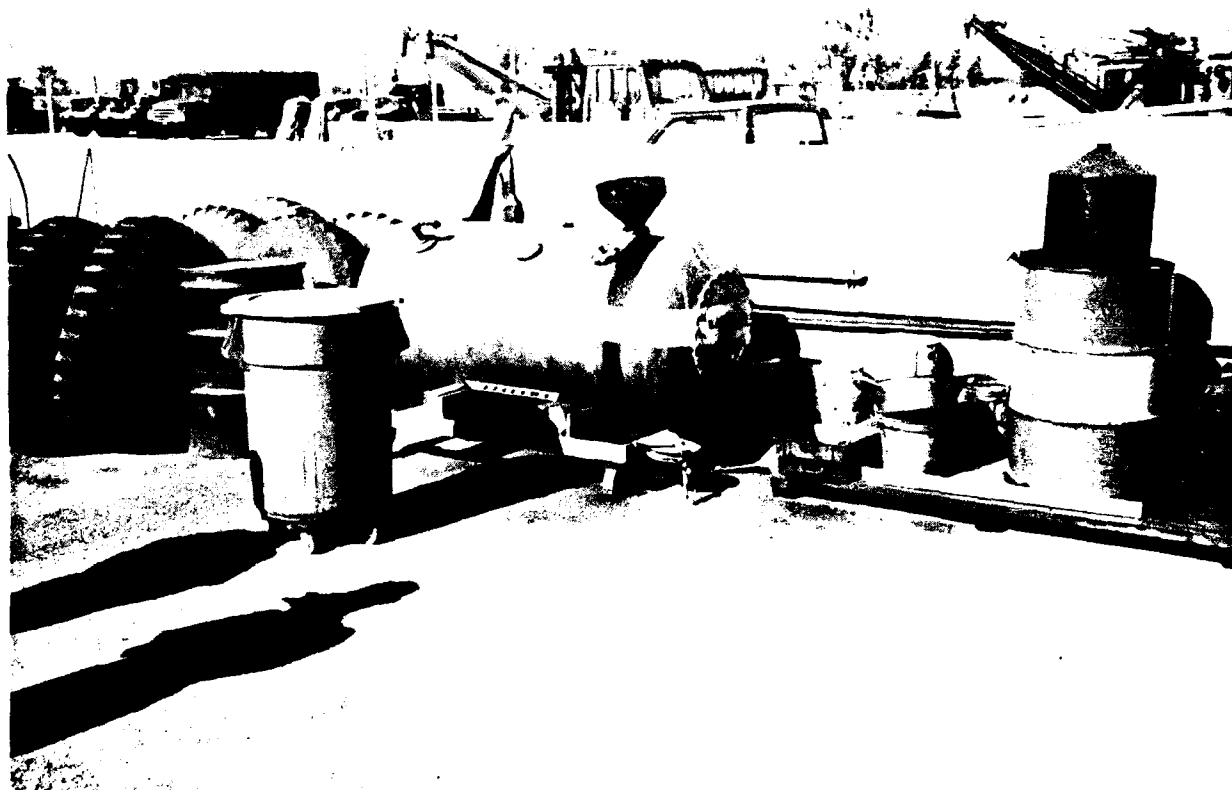


Figure 23. 163 Transportation Maintenance Accumulation Site

Shop: Corrosion Control
Contact: TSgt Fortune

Building: 452/2309
AUTOVON: 947-3554

The 163 ANG Corrosion Control Shop is collocated with the 22 FMS Corrosion Control Shop. A complete description of the facility is presented under 22 FMS Corrosion Control.

Shop: NDI
Contact: TSgt Stuart

Building: 1238
AUTOVON: 947-3812

The 163 ANG NDI Shop is collocated with the 22 FMS NDI Control Shop. A complete description of the facility is presented under 22 FMS NDI.

Shop: Propulsion
Contact: Mr Bashaw

Building: 458
AUTOVON: 947-3558

Shop personnel are responsible for performing all J79-17 aircraft engine maintenance. The majority of wastes generated at this shop are petroleum products and PD-680 solvent. Approximately 20 gallons per month of waste oil is placed in a bowser, transported to the 22 OMS Accumulation Site (Building 440), drummed and stored.

The shop operates a 50-gallon PD-680 degreasing unit and a 200-gallon sodium hydroxide cleaning tank. The PD-680 unit is changed out semiannually and the waste solvent is hand carried to the OMS Accumulation Site and stored in the OMS mixed solvent drum. The sodium hydroxide cleaning tank is cleaned out annually and the waste sodium hydroxide is drummed and stored at the OMS Accumulation Site. All wastes are picked up by a contractor. Oily rags (approximately 100 pounds per month) are stored at the new accumulation site behind Building 458 for contractor pick up. Approximately 10 gallons per month of PD-680 is rinsed down the drain during washing operations.

Shop: AGE
Contact: Mr Dodds

Building: 440
AUTOVON: 947-2779

163 ANG AGE personnel service, repair, inspect and move flight line powered aerospace ground support equipment. Petroleum wastes comprise the majority of the waste generated. Waste oils (approximately 80 gallons per month) are stored in a 500-gallon tank. The petroleum waste tank is emptied at the base service station holding tank. Waste fluids, including brake fluid (1 quart per month), hydraulic fluid (10 gallons per month), and 7808 oil (6 gallons per month) are drummed and stored at the Building 440 Accumulation Site.

Approximately 10 gallons of BUBCO, a biodegradeable cleaning solvent, and 15 gallons of antifreeze are diluted with water before discharge to the sanitary sewer system, monthly. Thirty-five gallons per month of fuel is returned to fuel tanks for reuse. Oily rags, filters, and oil cans are drummed together and stored in the parking lot next to the dumpster (Figure 24).



Figure 24. 163 AGE Oily Rag Accumulation Site

163 CE Maintenance:
Repair and Reclamation/
Electrical Shop/
Pneudraulics
Contact: MSgt Rodriguez

Building: 2272

AUTOVON: 947-2648

The 163 CE Repair and Reclamation Shop, Electric Shop, and Pneudraulic Shop occupy three adjacent rooms in Building 2272. They all perform maintenance on F-4E aircraft components. Individually, the shops do not generate much hazardous waste other than some waste oils and fluids that are disposed of in flight line bowzers. However, the shops utilize a central cleaning room (Figure 25) that contains five PD-680 vats.

The Repair and Reclamation Shop personnel clean, repair and perform routine maintenance on F-4E wheel and landing assemblies. The shop generates no appreciable amounts of waste oils or fluids. The shop operates three PD-680 vats (a heavy cleaning vat, a bearing cleaning vat, and a final rinse vat containing a mixture of lube oil and PD-680) located in the cleaning room. Approximately 30 wheels per month are cleaned in the heavy cleaning vat. Wheels are air dried after final rinse.

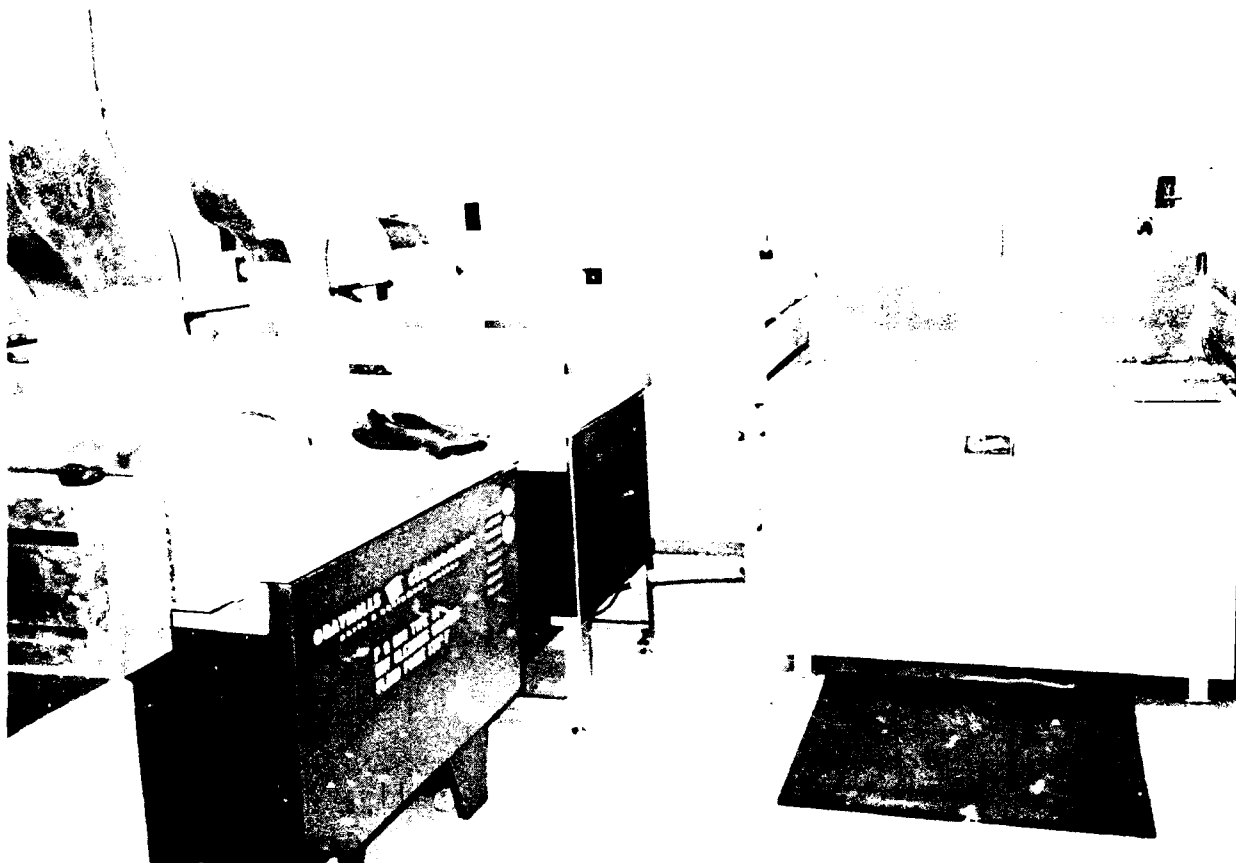


Figure 25. Building 2272 Cleaning Room

The Electric Shop personnel maintain the landing retraction gear for the F-4E aircraft. The shop generates 8-10 gallons of waste 7808 oil per month. Waste oil is disposed of in flight line waste oil bowlers. Approximately one gallon per month of PD-680 is used to wipe parts clean. The PD-680 is used up in process. The Shop operates one 30-gallon PD-680 vat in the cleaning room.

The Pneudraulic Shop tests and maintains hydraulic components from the F-4E aircraft. The shop generates eight gallons of waste hydraulic fluid and two gallons of waste synthetic oil per month and disposes of them in appropriate flight line bowlers.

The PD-680 vats in the cleaning room are cleaned out as needed. MSgt Rodriguez said that 4 drums of waste PD-680 and 1 drum of oily rags are generated per quarter from all the shops. The hazardous waste drums are stored at the Building 2272 Accumulation Site.

MSgt Rodriguez is the manager for the Building 2272 Accumulation Site. He is responsible for filling out DD Forms 1348-1 and contacting Lt Bachand when a hazardous waste pick up is needed. Access to the site is controlled by MSgt Rodriguez to limit the possibility of illegal dumping of chemicals. Shop personnel must contact him to gain access.

The Accumulation Site (Figure 26) was in reasonable condition. The site was secured, on an impermeable surface and contained drums that were in good condition. However, liquid would probably drain out the front of the facility if a spill occurred because the floor was sloped and not diked. Further, the facility lacked proper fire and spill protection equipment and warning signs identifying the name and telephone number of the accumulation site manager and an emergency telephone number.

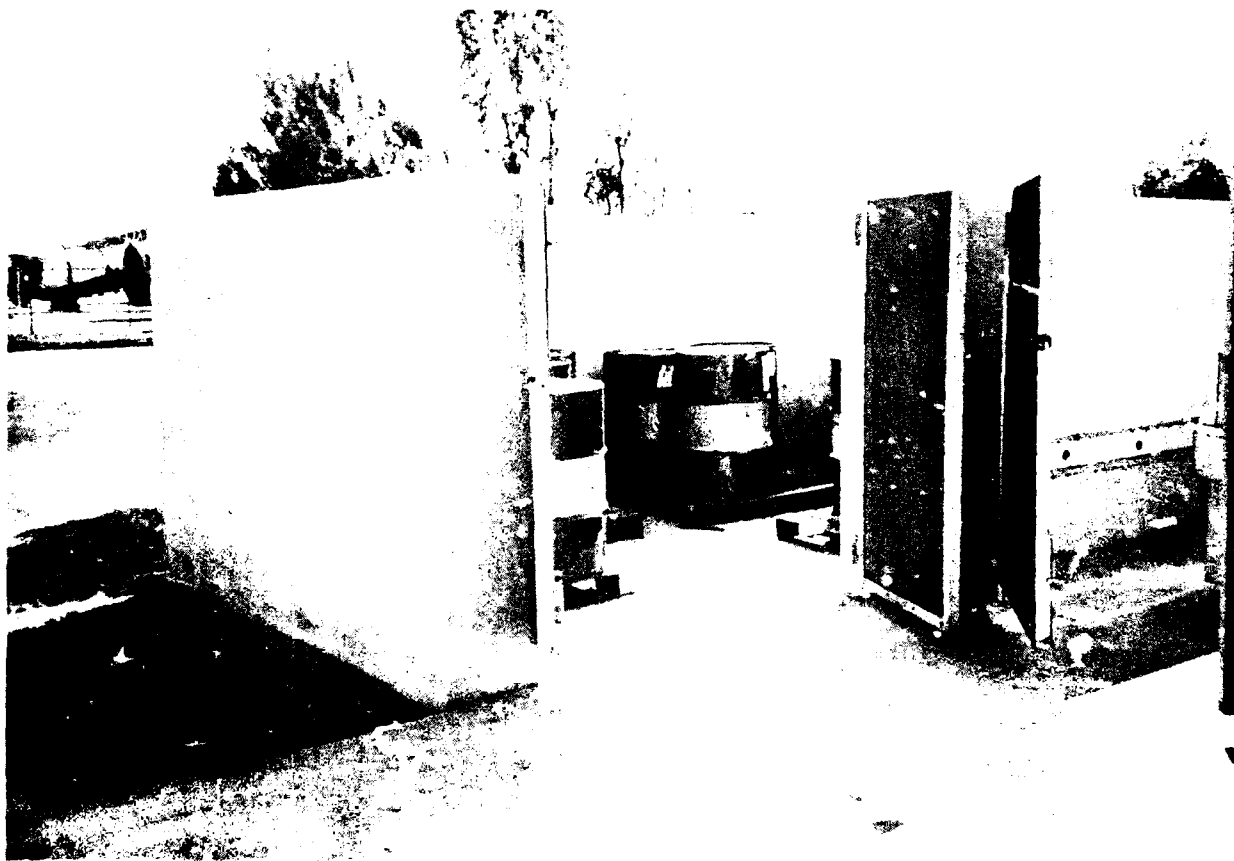


Figure 26. Building 2272 Accumulation Site

Shop: Fuel Systems
Contact: Sgt Moore

Building: 2309
AUTOVON: 947-3554

Shop personnel are responsible for repairing fuel bladders from F-4E aircraft. The shop generates no hazardous waste. Any fuel drained from the cells (50 gallons per month) is reused at the military gas station. Cleaning solvent is used up in process.

I. Hospital

Hospital
Contact: Mr Brooks

Building: 2990
AUTOVON: 947-4235

The Hospital generates very little hazardous waste. Waste generated is either incinerated in the facility's incinerator (located behind the hospital) or placed in the chemotherapeutic waste drum for contractual disposal. The chemotherapeutic waste drum is never full. The hospital generates approximately one drum of chemotherapeutic waste per year.

J. Accumulation Sites:

Eleven accumulation sites were visited at March AFB. Conditions at each site during field survey are presented in Table 2. The eleven sites visited were:

SITE	LOCATION	BUILDING
1	AGE (452AGE, 163 CAMS, 943 CAMS)	440
2	22 FMS Corrosion Control	452
3	452 CAMS/163 ANG Propulsion Shop	458
4	22 FMS Propulsion Shop	1203
5	22 FMS AGE	1221
6	163 ANG CE	2272
7	163 ANG Transportation	2274
8	452 CAMS Phase Docks	2306
9	943 CAMS Phase Docks	2307
10	163 ANG Munitions Maintenance	2315
11	22 CE Paint Shop	2505

TABLE 2. Conditions at Accumulation Site

Site	Site Number										
	1	2	3	4	5	6	7	8	9	10	11
CONDITIONS											
secure	N	Y	N	Y	N	Y	N	Y	N	N	N
gates locked	N	Y	N	Y	N	Y	N	Y	N	N	N
warning sign	N	N	N	Y	N	N	N	N	N	N	N
impermeable floor	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
diked/bermed	N	Y	Y	Y	Y	N	N	Y	N	N	N
valve in berm	N	Y	Y	Y	Y	N	N	Y	N	N	N
SPILL EQUIPMENT											
overpack	N	N ¹	N	N	N	N	N	N	N	N	N
spill supplies	N	N ¹	N	Y	N	N	N	Y	N	N	N
extinguisher	N	N	N	N	N	N	N	N	N	N	N
CONTAINERS											
funnels in container	N ²	N ²	Y	N ²	N ²	N ²	Y	N ²	N ²	N	Y
container closed	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
deteriorating	N	N	N	N	N	N	N	N	N	N	N
leaking	N	N	N	N	N	N	N	N	N	N	N
spills	N	N	N	N	N	N	N	N	N	N	N
labeled	O	Y	Y	Y	Y	Y	O	Y	Y	O	O
log maintained	O	O	O	Y	Y	O	O	Y	Y	O	O

N = NO

Y = YES

O = NOT OBSERVED

1 = FIRE DEPARTMENT RESPONSIBLE FOR SPILL CONTROL

2 = FUNNELS AVAILABLE BUT NOT IN BARRELS

V. SUMMARY OF GENERAL WASTE DISPOSAL PRACTICES AT MAFB

The waste disposal practices for different categories of waste are summarized in this section.

1. Used oil, used fluids (i.e., transmission fluid, brake fluid and hydraulic fluid) are drummed, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor. Some shops store wastes in bowsters and ultimately transfer wastes to the service station holding tank. A contractor pumps the service station tank when necessary.

2. Most waste from PD-680 and other solvent tanks are drummed, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor. PD-680 used on washracks in cleaning procedures is typically caught in an oil/water separator.
3. Lithium batteries are palletized, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor.
4. Contaminated automotive fuel is drummed, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor.
5. Paint wastes and thinners are drummed, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor. Wastewater from waterfall paint booths is routinely discharged to the sanitary sewer system without prior hazardous waste analysis.
6. Neutralized battery acid from the FMS Battery Shop is drummed, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor. Batteries from the Auto Hobby Shop and base Service Station are sold to contractor.
7. Most stripping waste is drummed, held at an appropriate accumulation site and ultimately disposed of through a DRMO contractor. However, some stripping waste is lost to the sanitary sewer system from drag-out.
8. Waste antifreeze is drummed, held at an appropriate accumulation point and ultimately disposed of through a DRMO contractor.
9. NDI wastes are drummed, held at an appropriate accumulation point and ultimately disposed of through a DRMO contractor. The NDI Shop drums and transports waste developer to the base Photo Lab. The base Photo Lab discharges waste developer to the sanitary sewer system.
10. Waste photographic chemicals are discharged to the sanitary sewer system. Waste fixer is processed through a silver recovery unit before discharge to the sanitary sewer system.
11. Empty paint spray cans are thrown in the trash.
12. Speedy Dry, an absorbant chemical used in shops to clean up oil spills, is drummed along with waste rags and disposed of as hazardous waste.
13. Waste rags are typically drummed and disposed of as hazardous waste.

VI. OBSERVATIONS AND CONCLUSIONS:

A. MANAGEMENT

1. The base has no baseline physical and chemical analyses documenting the characteristics of hazardous wastestreams.

2. DRMO at Norton AFB serves Edwards AFB, George AFB, Norton AFB and March AFB and is currently backlogged with hazardous waste pick up requests. This backlog is causing hazardous waste pick ups to be behind schedule.

Prior to the last two hazardous waste pick ups, DRMO did not inspect the March AFB waste containers. Shop personnel said that the hazardous waste disposal contractor combined different petroleum wastes into one large tank and often identified contents of drums by smell. Empty waste drums were crushed to conserve space.

3. Lt Bachand assigns a serial number to each waste drum disposed of through DRMO. The serial numbers are sequential and are useful to the extent that the quantity of drums sent to DRMO can be recorded. However, the drums cannot be traced back to the shops generating the waste. Also, DRMO mentioned that the base was consistently using the incorrect terminology on waste identification forms submitted to DRMO. For example, the base is incorrectly identifying waste rags. The correct terminology is Flammable Solid NOS (not otherwise specified) and can be found in 49 CFR Hazardous Material Tables.

4. PD-680 is specified in many technical orders as the cleaning solvent of choice. Purchase of a vacuum recycler has been proposed for the recycling of PD-680. However, no base personnel are investigating its feasibility.

5. The waste antifreeze tank located outside the Auto Hobby Shop was not secured and appeared to be contaminated with motor oil. There were several deteriorating drums next to the facility, some of which contained unused solvents. The Auto Hobby Shop throws away approximately 10 drums of oily rags per month as municipal waste. They obtain the rags free of charge from the base hospital and the base linen supply. Used batteries are recycled through a local contractor who picks up the batteries free of charge.

6. Paint booth filters and wastewater, and glass bead blasting media are being disposed of without analyses to determine if they have hazardous waste characteristics. The paint booths are located at: Corrosion Control (Building 452); 22 Transportation (Building 429); 22 CES Paint shop (Building 2405); and the 163 Transportation Maintenance (Building 2274). The glass media bead blasting unit is located in Building 452, Corrosion Control.

7. Most accumulation sites were in excellent condition. However, every accumulation site lacked proper fire safety equipment and hazardous waste warning signs identifying the name and telephone number of the accumulation manager and an emergency telephone number. The following accumulation sites need attention: (1) 163 ANG Munitions Accumulation Site located outside Building 2315; (2) accumulation site located outside the 22 FMS Battery Shop; (3) 452 AGE Shop Accumulation Site (Building 440); (4) the CES Accumulation Site, next to Building 2405; (5) 943 CAMS Accumulation Site (Building 2307); and (6) 163 Transportation Accumulation Site, Building 2274.

The 163 ANG Building 2315 Accumulation Site was not covered, on an impermeable surface, diked or bermed, or secured and lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs. Drums being stored at the facility were on pallets and seemed to be in good condition.

The 22 FMS Battery Shop Accumulation Site was neither secured, diked, covered, located on an impermeable surface and lacked warning signs. There were two drums being stored at the site. One drum contained 95 percent acid; the other drum contained 95 percent water. The drum containing the water had never been tested for hazardous waste characteristics.

The 452 AGE Building 440 Accumulation Site was not secured, diked, or covered and had no warning signs, spill or fire protection equipment. Drums being stored at the facility seemed to be in good condition.

The CES Building 2405 Accumulation Site was not on an impermeable surface, diked or bermed, or secured and lacked proper fire protection and spill control equipment, and hazardous waste warning signs.

The 943 CAMS Building 2307 Accumulation Site was not secured, covered, or diked, and lacked proper fire protection equipment, spill control equipment, and hazardous waste warning signs. Drums being stored at the facility seemed to be in good condition.

The 163 Transportation Accumulation Site was not secured, covered, or diked, and lacked proper fire protection and spill control equipment, and hazardous waste warning signs. Drums being stored at the facility seemed to be in good condition.

The new accumulation site located outside Building 2303 is not being used although it seems to be in excellent condition. Allied Trades, Building 457, has a new accumulation site that cannot be used because the entrance is blocked by an air conditioner.

The 22 Safety Squadron mentioned they will be inspecting base accumulation sites annually.

8. A plastic media bead blasting unit has been sitting idle at the corrosion control facility (Building 452) since 1983. The unit lacks an appropriate compressor. According to TSgt Zaiger, use of the unit would cut chemical stripper usage by 50 percent.

9. Hazardous waste training is conducted on a one-to-one basis by Lt Bachand. Although this seems to be effective, a formalized class coordinated with the BEE Shop (and DRMO) and taught semiannually to all the accumulation site managers would make the program more uniform and allow an open forum for discussion.

10. Blueprints and work orders are not routinely reviewed by the Environmental Coordinator.

11. The CES Entomology shop is storing out-dated poisonous chemicals (approximately three pounds of wet and dry chemicals) in a locker.

12. POL tanks are cleaned out by contract. The contractor takes care of all aspects of the cleaning, including sludge removal. Shop personnel gain tank cleaning experience through observation of the contractors. The tanks are cleaned out every five or eight years depending on the size of the tank.

13. Mr Roberts, from the base service station, recommends reaccomplishing the leak-test on the base service station underground fuel tank. He has stated that an access valve was inadvertently left open during the recent test and might possibly invalidate the test. The tank was apparently operating perfectly with no significant loss of fuel at the time of the survey.

14. The hospital does not dispose of any hazardous waste through DRMO. Biological materials are incinerated on site.

15. The base Fire Department uses new fuel for fire training. They also suggested that the Fire Department be notified when a waste disposal contractor comes on base to pick up hazardous waste.

16. The Environmental Coordinator plans to rewrite the base hazardous waste management plan.

B. MINIMIZATION

1. March AFB personnel are currently drumming waste antifreeze and disposing of it as hazardous waste. This was necessary because the sewage treatment plant personnel would not allow waste antifreeze to be discharged to the sanitary sewer. The survey team discussed this practice with the sewage treatment plant director, Mr Swope. Mr Swope was willing to allow the discharge of antifreeze from Allied Trades and Transportation into the sanitary sewer on a trial basis. The waste discharges must occur at the main lift station (Building 1269) where they can be monitored.

The sewage treatment plant has consistently exceeded its National Pollution Discharge Elimination System (NPDES) permit for boron and sulfates. The probable source of boron contamination is the aircraft soap used on the washracks. Since boron is not a common component of all aircraft soaps we suggest changing to a soap that does not contain boron. Sulfate contamination probably originates from the water treatment unit which deionizes aircraft system water. A wastewater characterization survey of the entire sewer system would be necessary to determine if there are other sources of sulfates.

2. The 163 ANG Transportation Shop (Building 2274) is in the process of replacing its PD-680 tank with a Safety Kleen unit. Corrosion Control, Building 452, has a new PD-680 tank but lacks an air quality permit.

Several shop managers expressed the desire to replace their PD-680 degreasing tanks with Safety Kleen products. These shops are as follows: 163 ANG Munitions Maintenance (Building 2315); Corrosion Control (Building 452); 452 Aerospace Systems (Building 2303); 943 Propulsion Shop (Building 2303); 943 Pneudraulics, 943 Environmental Systems (Building 2307); and the 163 ANG cleaning room servicing the shops in Building 2272.

Corrosion Control personnel are currently testing a B&B Chemical Company soap product that may be used in place of PD-680. TSgt Fortune stated that B&B 2034 works very well and does not leave a film on washed products like PD-680 does.

3. Almost all waste rags used on base are being drummed and disposed of as hazardous waste. However, March AFB is the only base serviced by DRMO that is drumming all of its waste rags. The base generates approximately 50 drums of waste rags per quarter at an approximate cost of \$15,000. During the survey, several shop personnel said they would be willing to wash dirty rags to minimize disposal costs and reduce the cost of purchasing new rags. Shop personnel from 163 Munitions Maintenance do not drum their oily rags for disposal as hazardous waste. They place the rags in plastic bags and throw them away with the municipal waste. Also, waste rags at the Auto Hobby Shop are disposed of as municipal waste.

VII. RECOMMENDATIONS:

An outbriefing on recommendations was given to the Base Civil Engineer, the Environmental Coordinator and the Base Bioenvironmental Engineer on 17 Mar 88.

A. MANAGEMENT

1. The base should create a formal Waste Analysis Plan to develop baseline analytical data for hazardous waste. At a minimum this plan should include: a complete listing of all known wastestreams with a brief description of the process or operation generating the waste; the results of a baseline chemical analysis (to fully characterize the waste); the required analysis frequency; the sampling technique; and the parameters of analysis (see Figure 27), in addition to the information already provided in the base's Hazardous Waste Management Plan. Since the base does not have a large number of wastestreams, this type of sampling program will allow the base to establish, within a reasonable time, documented rationale for classifying each wastestream as either hazardous or nonhazardous. For example, neutralized battery acid rinsewater is disposed of as hazardous waste, yet, it has not been adequately analyzed for heavy metals to substantiate whether or not it is hazardous.

2. Warning signs should be posted at all hazardous waste accumulation points. The signs should include the name and telephone number of the accumulation site manager. Proper fire protection equipment, such as extinguishers, should be placed at every accumulation site.

3. The Battery Shop Accumulation Site should be moved inside Building 1201 and changed to satellite accumulation site status. There are currently two barrels at the Battery Shop Accumulation Site. One barrel contains 95% waste acid and 5% water; the other barrel contains 95% water and 5% neutralized acid. Both barrels are currently being disposed of as hazardous waste. The barrel containing 95% water should be tested for hazardous waste characteristics as it is primarily water. The contents could probably be discharged to the sanitary sewer. The barrel containing 95% acid could then be moved inside the shop. Satellite accumulation sites have very few requirements other than some container integrity requirements and storage of only up to 55 gallons of waste at one time. When 55 gallons of waste accumulate, Lt Cafiso could be contacted to transport the waste to the Building 1203 Accumulation Site. Otherwise, the Accumulation Site located outside the Battery Shop must be modified to meet accumulation site requirements.

GENERATOR LOCATION	DESCRIPTION OF WASTE STREAM	WASTE STREAM CODE	BASELINE ANALYSIS DATE & RESULTS	*SAMPLING METHOD	*SAMPLING FREQUENCY	*PARAMETERS REQUIRED	*TEST METHOD	PROPER SHIPPING NAME & HAZARD CLASS	DISPOSAL METHOD	EPA HAZARDOUS WASTE #
Corrosion Control BLD 150	Paint sludge from paint booth	CC150-001	May 88 FP-NH (70F) PH-NH RX-NH EP-H Cadmium Chromium	1 Grab sample	Every other drum	Flash Point	1010	Waste Paint related material, mixture/FLAMMABLE LIQUID	DRMO	D001
Corrosion Control BLD 150	Rinsewater from waterfall paint booth	CC150-002	May 88 FP-NH PH-NH RX-NH TM-NH	Dipper	Every third cleanout of booth	Complete Analysis	7130 7190	N/A	Down Drain	D006 D007
Corrosion Control BLD 150	Spent plastic bead blasting media	CC150-003	Aug 88 FP-NH PH-NH RX-NH EP-H Cadmium Chromium	1 Composite Sample	From every other drum			Hazardous waste solid (n.o.s.) (Cadmium & Chromium contaminated material)	DRMO	D006 D007
Vehicle Maint. BLD 100	Waste Motor oil	VM100-001	Jun 88 FP-NH (100F) PH-NA RX-NH TN-H Arsenic Cadmium Chromium Lead Total Halogens	Collivasa	Quarterly	Flash Point	1010	N/A	Sold to Contractor for Recycle	D001
Vehicle Maint. BLD 100	Neutralized Battery Acid	VM100-002	Aug 88 FP-NH PH-NH RX-NH TM-NH	Grab Sample from tank using dipper	Semiannual	Arsenic Cadmium Chromium Lead Total Halogens	7061 7130 7190 7421 8010	N/A	Down Drain	D004 D006 D007 D008

Legend: FP - Flash Point
EP - EP Toxicity
TM - Total Metals
RX - Reactivity
NA - Not Applicable
H - Hazardous
NH - Non-Hazardous

Figure 27. Example of Waste Analysis Plan

4. Blueprints and work orders should be routinely reviewed for environmental considerations by the Environmental Coordinator.

5. A lock should be installed on the Auto Hobby Shop waste antifreeze tank to discourage any improper mixing or contamination of the waste antifreeze. Disposal or utilization of the solvent drums outside the Auto Hobby Shop should be investigated.

6. Air filters and wastewater from paint booths (Buildings 2405, 429, 2274 and 452) along with spent bead blasting media from the Corrosion Control glass bead blasting unit should be periodically tested for hazardous waste characteristics. These wastes are currently disposed of in the trash or sanitary sewer system without confirmation that they are not hazardous waste.

7. A formalized hazardous waste training program should be developed and presented to the accumulation site managers as a group. The training should be coordinated with the Bioenvironmental Engineering Shop, DRMO and Fire Department and given semiannually.

8. The outdated poisonous chemicals being stored at the CES Entomology Shop should be disposed of through DRMO.

9. A manager for the accumulation site located next to Building 458 needs to be formally designated.

10. The barrels of hazardous waste located outside of Building 2315 in the parking lot should be placed in an acceptable accumulation site.

11. A basewide hazardous waste tracking system should be developed. Each wastestream and shop should be assigned an individual set of serial numbers to be listed on any waste drums disposed of through DRMO. This will enable Lt Bachand and DRMO to track waste drums back to their specific shop and wastestream. Currently, barrels can only be tracked back to the base.

12. Proper waste identification terminology from 49 Code of Federal Regulations (49 CFR) should be used on all paperwork submitted to DRMO. For example, waste rags should be listed as Flammable Solids NOS (not otherwise specified).

13. The Base Environmental Protection Committee should assign someone the responsibility of investigating the feasibility of a PD-680 vacuum recycler.

14. The Bioenvironmental Engineering Shop needs to obtain proper sampling equipment for hazardous waste sampling, e.g., disposable coliwasa.

15. The NDI Shop should consider discharging waste developer directly down the drain instead of drumming and transporting to the base photo lab. A baseline analysis of this wastestream should be done prior to changing disposal procedures. The analyses should include characteristic hazardous waste tests (SW846).

16. The base should address with DRMO the need to schedule more frequent waste pick ups.

17. The Environmental Coordinator should notify the Fire Department when a waste disposal contractor comes on base.

B. MINIMIZATION

1. Safety Kleen units or products such as Citrikleen or Penetone 724 should be considered as alternative solvents to minimize the use of PD-680. Safety Kleen Corporation can supply a solvent that is equivalent to PD-680. Shops using PD-680 for degreasing are: 22 FMS Corrosion Control (Building 452); 22 FMS Jet Engine Shop (Building 1203); 22 FMS Repair and Reclamation (Building 1246); 452 Aerospace Systems (Building 2303); 452 AGE Shop (Building 440); 452 CAMS Engine Shop (Building 440); 943 Propulsion Shop (Building 2303); 943 Repair and Reclamation and Environmental Systems (Building 2307); 943 AGE Shop (Building 440); 163 CAMS Engine Shop (Building 458); 163 ANG Cleaning Room (Building 2272); 163 ANG Transportation Maintenance (Building 2274); and 163 ANG Munitions Maintenance (Building 2315).

2. The Safety Kleen Corporation has recently marketed a unit to clean painting equipment such as spray guns. Such a unit might be used in the 22 FMS Corrosion Control Shop, 22 FMS Allied Trades Shop and 163 ANG Transportation and Maintenance Shop to reduce the amount of paint waste generated from these shops.

3. The base should look into selling used lead-acid batteries. The base service station sells waste batteries to a local Riverside company for 50-75 cents per battery, and the Auto Hobby Shop gives waste batteries to a local contractor at no cost to the shop. The 22 FMS Battery Shop drums waste battery acid and neutralization rinsewater and disposes of them as hazardous waste.

4. A determination of whether the used rags at March AFB are hazardous waste or not needs to be made. Currently March AFB is the only one of four bases serviced by DRMO that drums all of their waste rags.

5. The base should investigate the possibility of washing and reusing oily rags. Alternatives include: drumming or triple bagging before disposal in a municipal landfill; or washing, drumming or triple bagging before disposal in a municipal landfill.

6. The base should pursue Mr Swope's offer to allow used antifreeze to be discharged into the sanitary sewer system. As stipulated by Mr Swope, the discharge should occur at the Building 1269 Main Lift Station where it can be monitored.

7. A compressor for the plastic media bead blasting unit at FMS Corrosion Control should be purchased. Use of the unit will cut chemical stripping by 50% (or 420 gallons of stripper per year). Cost savings would be significant when disposal costs of approximately five dollars per gallon of stripper are added to the purchase price of the product.

8. The base should investigate obtaining a waste transporter permit and a licensed vehicle which meet the requirements specified in 49 CFR 177. This may permit transporting hazardous waste to DRMO at Norton AFB in order to be included in reuse or recycling efforts along with other bases.

REFERENCES

1. March Air Force Base, "Hazardous Waste Management (HWM) Plan," August 1986.
2. March Air Force Base, "Operations Plan 19-3 Spill Prevention and Response Plan," February 1987.
3. United States Environmental Protection Agency, "Identification and Listing of Hazardous Waste," 40 CFR 261.

Appendix A
Request Letter

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DEPARTMENT OF THE AIR FORCE
UNITED STATES AIR FORCE REGIONAL HOSPITAL (SAC)
MARCH AIR FORCE BASE CALIFORNIA 92518-5300

REPLY TO
ATTN OF:

SGPB

18 September 1987

SUBJECT: Hazardous Waste Assistance Survey

TO:

SGP

SG

USAF OEHL/ECQ (Major Ng) *12/29/87*

IN TURN

1. Request a Hazardous Waste Assistance Survey be conducted at March AFB. Increased regulatory surveillance is anticipated due to ground-water contamination found during the Installation Restoration Program investigation, addition of inspectors to EPA Regional IX staff and development of local hazardous waste management requirements by the Department of Health Services.
2. It is our understanding that the survey will focus on waste minimization, waste management practices and will include a review of the Base Hazardous Waste Management plan and interviews/discussions with Bioenvironmental Engineering, Environmental Coordinator and shop supervisors/personnel.
3. If you have any questions or need additional information, please contact me or 2Lt Gooden at AV 947-3952.

GENE A. KILLAN, Major, USAF, BSC
Chief, Bioenvironmental Engineering

cc: HQ SAC/SGPB

UNITED STATES AIR FORCE



SEPTEMBER 18, 1947

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Appendix B
Waste Disposal Form

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Shop:
Shop Supervisor:
Shop Activities:

Building Number:
Activity: X-

CATEGORIES OF WASTE AND DISPOSAL METHODS

TYPE OF WASTE	DISPOSAL METHOD	AMOUNT GENERATED (per month)	COMMENTS
1. * PAINT WASTE AND THINNERS	XXXXXXXXXX		
2. * STRIPPING WASTE	XXXXXXXXXX		
3. * WASTE ACIDS	XXXXXXXXXX		
4. * SOAPS/CLEANERS			
5. * WASTE OIL			
6. * WASTE FLUIDS			
7. * WASTE FUELS			
8. USED ANTIFREEZE			
9. * WASTE SOLVENTS OTHER THAN PD-680	XXXXXXXXXX		
10. * PD-680			
a. USED IN A TANK/VAT (NORMALLY DRUMMED)			
b. USED FOR WASHING (NORMALLY RINSED DD)	RDD		
11. * PHOTO WASTES	XXXXXXXXXX		
12. *			

* specify the types used on next page

Examples of disposal Practices:

D-DRUMMED FTT-RETURNED TO FUEL TANKS DD-DOWN DRAIN PIT-PLACED IN TANK
RDD-NEUTRALIZED FIRST THEN PLACED DOWN DRAIN NA-NOT APPLICABLE

SPECIFIC CHEMICALS USED
PAINT WASTE AND THINNERS

Specific Waste Types	Waste Disposal	Amount of Waste Generated per month
-------------------------	----------------	--

Paints (add to list if necessary)

Latex _____
 Polyurethane _____
 Enamel _____

Thinners (list)

DOES THE SHOP USE ANY SAFETY KLEEN UNITS TO CLEAN PAINTING EQUIPMENT?
 (YES / NO) CIRCLE ONE
 IF SO HOW MANY UNITS? _____
 CAPACITY OF EACH UNIT: _____

STRIPPERS

Name of Stripper	Manufacturer	National Stock Number	Amt used (month or		Disposal
			Tank Cap.	Change out Freq.	
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

ACIDS

Name of Acid	Manufacturer	Amt used/mo	Disposal Method
Battery Acid	XXXXXXXXXXXX	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

SOAPS/CLEANERS

Name of Soap	Manufacturer	Amt used/mo	National Stock Number
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

OILS FLUIDS

Type of oil/fluid	Amt used/month	Disposal Method (if waste goes to a Tank give Capacity and location)
-------------------	----------------	--

Brake Fluid _____

Transmission Fluid _____

Hydraulic Fluid _____

7808 Oil _____

SOLVENTS/DEGREASANTS

Name of Chemical	Manufacturer	NSN	Amt used/month or		Disposal
			Tank Cap.	Change out/ Freq.	

Carbon Remover _____

PD-680 used in a tank/vat _____

XXXXXXXXXX

PD-680 used on the Washrack _____

XXXXXXXXXX

DOES THE SHOP USE ANY SAFETY KLEEN DEGREASING UNITS (Y/N)? IF SO HOW

MANY: _____

CAPACITY OF EACH UNIT: _____

PHOTO CHEMICALS

Name of Chemical	Manufacturer	Amt/month or		Disposal Method
		Tank Cap.	Change out/ Freq.	

NDI CHEMICALS

Name of Chemical	Manufacturer	National Stock Number	Amt/month or		DISPOSAL METHOD
			Tank Cap.	Change out Freq.	
Emulsifier					
Dye Penetrant					
Developer					

Other Chemicals Not Listed

Name of Chemical	Manufacturer	NSN	Amt/month or		DISPOSAL METHOD
			Tank Cap.	Change out Freq.	

SIGNATURE OF PERSON FILLING OUT THE FORM: _____

Appendix C
Summary of Annual Forecasted
Wastes Generated by Category

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SUMMARY OF ANNUAL FORECASTED WASTE GENERATED BY CATEGORY

PAINT WASTE AND THINNERS

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 Corrosion Control	452	240	D
22 CE Paint Shop	2405	24	D
22 CE Paint Shop	2405	24	D
22 Corrosion Control	452	240	D
22 Allied Trades	429	180	D
943 Jet Engine Shop	1203	24	NA
TOTAL:		732	

PAINT STRIPPER

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 Corrosion Control	452	600	D
22 Corrosion Control	2309	330	D
Satellite Shop			
22 Corrosion Control	2309	40	D
Satellite Shop			
22 Allied Trades	429	12	D
TOTAL:		982	

WASTE ACIDS

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
452 AFREW AGE Shop	440	24	D
22 Battery Shop (Allied Trades)	429	50	D
22 Battery Shop	1201	990	D
22 Corrosion Control	452	660	NDD
TOTAL:		1724	

SOAPS AND CLEANERS

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 Refueling Maint	1250	600	DD
943 Jet Engine Shop	1203	1	NDD
22 Corrosion Control	452	120	RDD
22 Allied Trades	429	660	DD
163 TFG/CAMS Engine Shop	458	5	DD
452 ARFEW AGE Shop	440	180	DD
22 Spec/Gen Purpose Maint	429	120	DD
22 Fire Truck Maintenance	1223	9	DD
163 TFG/MAFW AGE Shop	440	480	DD
TOTAL:		2175	

OILS AND FLUIDS

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
943 Jet Engine Shop	1203	180	D
452 CAMS Engine Shop	458	24	D
Auto Hobby Shop	941	3000	PIT
163 Trans Maint	2274	55	D
163 TFG/MAFW AGE Shop	440	960	PIT
943 Jet Engine Shop	1203	24	D
22 Phase Dock	2307	360	D
943 CAMS Propulsion	2303	248	D
452 ARFEW AGE Shop	440	24	D
163 Pneudraulic Shop	2272	8	D
22 FMS Repair & Reclamation	1246	24	D
163 ANG Electric Shop	2272	120	D
163 TFG/MAFW AGE Shop	440	360	D
943 Phase Dock	2307	660	D
22 Spec/Gen Purpose Maint	429	300	PIT
452 ARFEW AGE Shop	440	480	PIT
943 Aerospace Systems	2303	24	D
Base Service Station	548	3000	PIT
22 Refueling Maint	1250	84	D
452 ARFEW AGE Shop	440	480	PIT
943 Aerospace Systems	2303	24	D
22 Refueling Maint	1250	84	D
22 Fire Truck Maint	1223	24	D
943 AGE	440	180	D
943 CAMS Pneudraulic	2307	108	D
163 Trans Maint	2274	600	PIT
22 Refueling Maint	1250	216	D
452 CAMS Engine Shop	458	24	D
163 TFG/CAMS Engine Shop	458	240	D
943 AGE	440	10	D
22 Fire Truck Maint	1223	240	PIT
TOTAL:		14397	

FUELS

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 AGE	1221	120	D
163 TFG/MAFW AGE Shop	440	420	RTT
943 Jet Engine Shop	1203	48	D
943 CAMS Fuel Systems	2307	240	PIT
163 TFG/CAMS Engine Shop	458	180	D
22 Refueling Maint	1250	1500	DD
452 CAMS Engine Shop	458	24	D
943 Aerospace Systems	2303	1200	D
TOTAL:		3732	

ANTIFREEZE WASTE

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
Base Service Station	548	165	D
Auto Hobby Shop	941	120	PIT
22 Fire Truck Maint	1223	100	PIT
452 ARFEW AGE Shop	440	48	PIT
22 Refueling Maint	1250	60	D
22 AGE	1221	360	D
163 TFG/MAFW AGE Shop	440	180	DD
TOTAL:		1033	

SOLVENTS OTHER THAN PD-680

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 Corrosion Control	2309	140	D
Satellite Shop			
163 TFG/CAMS Engine Shop	458	300	D
163 TFG/MAFW AGE Shop	440	34	PIT
163 Munitions	2315	100	D
452 CAMS Engine Shop	458	4	D
TOTAL:		578	

PD-680

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 Corrosion Control	452	600	D
452 ARFEW AGE Shop	440	24	RDD
163 Trans Maint	2274	80	D
163 Cleaning Room	2272	880	D
22 FMS Repair & Reclamation	1246	550	D
163 TFG/CAMS Engine Shop	458	120	RDD
163 TFG/CAMS Engine Shop	458	300	D
943 CAMS Propulsion	2303	45	D
943 Repair & Reclamation	2307	130	D
452 CAMS Engine Shop	458	20	D
22 Corrosion Control	452	120	RDD
943 AGE	440	10	D
943 Aerospace Systems	2303	120	D
943 Jet Engine Shop	1203	84	D
163 Munitions	2315	200	D
TOTAL:		3283	

NDI WASTES (DEVELOPERS AND FIXERS)

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
22 NDI Lab	1238	40	D
22 NDI Lab	1238	100	D
22 NDI Lab	1238	220	D
22 NDI Lab	1238	100	D
22 NDI Lab	1238	30	DD
22 NDI Lab	1238	30	NDD
TOTAL:		520	

SAFETY KLEEN UNITS

SHOP	BUILDING	QTY(UNITS)	DISPOSAL
22 Fire Truck Maint	1223	1	NA
Auto Hobby Shop	941	1	NA
22 Gen/Spec Purpose Maint	429	2	NA
22 Refueling Maint	1250	1	NA
TOTAL:		5	

OILY RAGS

SHOP	BUILDING	QTY(DRUMS)	DISPOSAL
452 CAMS Engine Shop	458	4	D
22 Corrosion Control	452	12	D
22 Battery (Allied Trades)	429	3	D
943 CAMS Propulsion	2303	12	D
22 Phase Dock	2307	12	D
943 Jet Engine Shop	1203	36	D
22 Spec/Gen Purpose Maint	429	12	D
22 FMS AGE	1221	12	D
Auto Hobby Shop	941	120**	PID
452 AFREW AGE Shop	440	12	D
22 Repair & Reclamation	1246	12	D
163 TFG/CAMS Engine Shop	458	12	D
Base Service Station	548	2	NA
22 Allied Trades	429	4	D
22 Fabrication/Machine Shop	453	12	D
163 TFG/MAFW AGE Shop	440	12	D
163 CE	2273	1	D
TOTAL:		170	

CHEMOTHERAPEUTIC WASTE

SHOP	BUILDING	QTY(GALLONS)	DISPOSAL
Hospital	2990	50	D
	TOTAL:	50	

LEGEND:

D = DRUMMED
 DD = DUMPED DOWN DRAIN
 NDD = NEUTRALIZED AND DUMPED DOWN THE DRAIN
 PIT = PUT IN TANK
 RDD = RINSED DOWN DRAIN
 RTT = RETURNED TO TANK
 PID = PUT IN DUMPSTER
 ** = DISPOSED OF WITH MUNICIPAL WASTE (NOT INCLUDED IN TOTAL)

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Appendix D
Waste Disposal Practices by Shop

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WASTE DISPOSAL PRACTICES BY SHOP FOR MARCH AFB
(ANNUAL QUANTITIES)

163 ANG ELECTRIC SHOP, BUILDING 2272

WASTE PRODUCT	(GALLONS)	DISPOSAL
7808 Oil	120	D
TOTAL:	120	

163 CE, BUILDING 2273

WASTE PRODUCT	(DRUMS)	DISPOSAL
Oily Rags	1 DRUM	D
TOTAL:	1 DRUM	

163 MUNITIONS, BUILDING 2315

WASTE PRODUCT	(GALLONS)	DISPOSAL
Soap Solution	100	D
PD-680	200	D
TOTAL:	300	

163 TFG/CAMS ENGINE SHOP, BUILDING 458

WASTE PRODUCT	(GALLONS)	DISPOSAL
JP-4	180	D
PD-680	300	D
Sodium Hydroxide	300	D
7808 Synthetic Oil	240	D
PD-680	120	RDD
Oily Rags	(12 DRUMS)	D
Aircraft Soap	5	DD
TOTAL:	1145	

163 TFG/MAFW AGE SHOP, BUILDING 440

WASTE PRODUCT	(GALLONS)	DISPOSAL
Waste Fluid	360	D
Bubco Clean Crete	480	DD
Antifreeze	180	DD
JP-4	420	RTT
Oily Rags	(12 DRUMS)	D
Bubco	34	PIT
Waste Oil	960	PIT
TOTAL:	2434	

163 TRANSPORTATION MAINTENANCE, BUILDING 2274

WASTE PRODUCT	(GALLONS)	DISPOSAL
PD-860	80	D
Oil	600	PIT
Synthetic Oil	55	D
TOTAL:	735	

22 FMS AGE, BUILDING 1221

WASTE PRODUCT	(GALLONS)	DISPOSAL
Waste Fuel	120	D
Oily Rags	(12 DRUMS)	D
Antifreeze	360	D
TOTAL:	480	

22 FMS BATTERY SHOP, BUILDING 1201

WASTE PRODUCT	(GALLONS)	DISPOSAL
Acids and Water	990	D
TOTAL:	990	

22 FMS REPAIR & RECLAMATION, BUILDING 1246

WASTE PRODUCT	(GALLONS)	DISPOSAL
PD-680	550	D
Oily Rags	(12 DRUMS)	D
Hydraulic Fluid	24	D
TOTAL:	574	

452 AFREW AGE SHOP, BUILDING 440

WASTE PRODUCT	(DRUMS)	DISPOSAL
Oily Rags	(12 DRUMS)	D
TOTAL:	12 DRUMS	

452 AFREW AGE SHOP, BUILDING 440

WASTE PRODUCT	(GALLONS)	DISPOSAL
PD-680	24	RDD
Antifreeze	48	PIT
Petroleum Products	480	PIT
Aircraft Shop	180	DD
7808 Oil	24	D
battery Acid	24	D
Hydraulic Fluid	24	D
TOTAL:	804	

452 CAMS ENGINE SHOP, BUILDING 458

WASTE PRODUCT	(GALLONS)	DISPOSAL
Hydraulic Fluid	24	D
JP-4	24	D
Carbon Remover	2	D
Fingerprint Remover	2	D
Waste Oil	24	D
PD-680	20	D
Oily Rags	(4 DRUMS)	D
TOTAL:	96	

943 AGE, BUILDING 440

WASTE PRODUCT	(GALLONS)	DISPOSAL
Motor Oil	180	D
Synthetic Oil	10	D
PD-680	10	D
TOTAL:	200	

943 CAMS FUEL SYSTEMS, BUILDING 2307

WASTE PRODUCT	(GALLONS)	DISPOSAL
JP-4	240	PIT
TOTAL:	240	

943 CAMS PNEUDRAULIC, BUILDING 2307

WASTE PRODUCT	(GALLONS)	DISPOSAL
Hydraulic Fluid	108	D
TOTAL:	108	

943 CAMS PROPULSION, BUILDING 2303

WASTE PRODUCT	(GALLONS)	DISPOSAL
Engine Oil	248	D
PD-680	45	D
Oily Rags	(12 DRUMS)	D
TOTAL:	293	

943 REPAIR & RECLAMATION, BUILDING 2307

WASTE PRODUCT	(GALLONS)	DISPOSAL
PD-680	130	D
TOTAL:	130	

AEROSPACE SYSTEMS, BUILDING 2303

WASTE PRODUCT	(GALLONS)	DISPOSAL
Waste Fuel	1200	D
Hydraulic Fluid	24	D
PD-680	120	D
TOTAL:	1344	

ALLIED TRADES, BUILDING 429

WASTE PRODUCT	(GALLONS)	DISPOSAL
Soap Cleaners	660	DD
Oily Rags	(4 DRUMS)	D
Paint Stripper	12	D
Paint Waste	180	D
TOTAL:	852	

AUTO HOBBY SHOP, BUILDING 941

WASTE PRODUCT	(GALLONS)	DISPOSAL
Waste Oil	3000	PIT
Antifreeze	120	PIT
Oily Rags	(120 DRUMS)	PID
Safety Kleen	(1 UNIT)	NA
TOTAL:	3120	

BASE SERVICE STATION, BUILDING 548

WASTE PRODUCT	(GALLONS)	DISPOSAL
Antifreeze	165	D
Safety Kleen Unit	(2 UNITS)	NA
Waste Oil	3000	PIT
TOTAL:	3165	

BATTERY (ALLIED TRADES), BUILDING 429

WASTE PRODUCT	(GALLONS)	DISPOSAL
Oily Rags	(3 DRUMS)	D
Waste Acid	50	D
TOTAL:	50	

CE PAINT SHOP, BUILDING 2405

WASTE PRODUCT	(GALLONS)	DISPOSAL
Lacquer Thinner	24	D
Mineral Spirits	24	D
TOTAL:	48	

CLEANING ROOM, BUILDING 2272

WASTE PRODUCT	(GALLONS)	DISPOSAL
PD-680	880	D
TOTAL:	880	

CORROSION CONTROL, BUILDING 452

WASTE PRODUCT	(GALLONS)	DISPOSAL
Thinners	240	D
Oily Rags	(12 DRUMS)	D
Paint Waste	240	D
Sodium Hydroxide	120	RRD
PD-680	600	D
Waste Acid	660	NDD
Stripping Waste	600	D
PD-680	120	RDD
TOTAL:	2580	

CORROSION CONTROL SATELLITE SHOP, BUILDING 2309

WASTE PRODUCT	(GALLONS)	DISPOSAL
Aluminum Stripper	40	D
Cleaner (B&B)	140	D
Stripper (B&B 9201)	330	D
TOTAL:	510	

FABRICATION/MACHINE SHOP, BUILDING 453

WASTE PRODUCT	(DRUMS)	DISPOSAL
Oily Rags	(12 DRUMS)	D
TOTAL:	12 DRUMS	

FIRE TRUCK MAINTENANCE, BUILDING 1223

WASTE PRODUCT	(GALLONS)	DISPOSAL
Waste Oil	240	PIT
Soap	9	DD
Transmission Fluid	24	D
Antifreeze	100	PIT
Safety Kleen Unit	(1 UNIT)	NA
TOTAL:	373	

GEN/SPEC PURPOSE MAINT, BUILDING 429

WASTE PRODUCT	(UNITS)	DISPOSAL
Safety Kleen Unit	2 UNITS	NA
TOTAL:	2 UNITS	

Shop: HOSPITAL, BUILDING 2990

WASTE PRODUCT	(GALLONS)	DISPOSAL
Chemotherapeutic	50	D
TOTAL:	50	

JET ENGINE SHOP, BUILDING 1203

WASTE PRODUCT	(GALLONS)	DISPOSAL
Enamel/Latex Paint	24	NA
TWL-100 Suds	1	NDD
7808 Engine Oil	180	D
JP-4	48	D
Carbon Remover	24	D
Oily Rags	(36 DRUMS)	D
PD-680	84	D
TOTAL:	361	

NDI LAB, BUILDING 1238

WASTE PRODUCT	(GALLONS)	DISPOSAL
Emulsifier	100	D
Dye Penetrant	100	D
Fixer	30	NDD
Developer	30	DD
Magnetic Inspectant	40	D
Developer	220	D
TOTAL:	520	

PHASE DOCK, BUILDING 2307

WASTE PRODUCT	(GALLONS)	DISPOSAL
Hydraulic Fluid	360	D
Synthetic Oil	660	D
Oily Rags	(12 DRUMS)	D
TOTAL:	1020	

PNEUDRAULIC SHOP, BUILDING 2272

WASTE PRODUCT	(GALLONS)	DISPOSAL
Lube Oil	8	D
Hydraulic Fluid	96	D
TOTAL:	104	

REFUELING MAINT, BUILDING 1250

WASTE PRODUCT	(GALLONS)	DISPOSAL
Safety Kleen	(1 UNIT)	NA
Antifreeze	60	D
Waste Fuel	1500	DD
Waste Oil	216	D
Transmission Fluid	84	D
Chem Lite Soap	600	DD
TOTAL:	2460	

SPEC/GEN PURPOSE MAINT, BUILDING 429

WASTE PRODUCT	(GALLONS)	DISPOSAL
Petroleum Products	3000	PIT
Aircraft Soap	120	DD
Oily Rags	(12 DRUMS)	D
TOTAL:	3120	

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